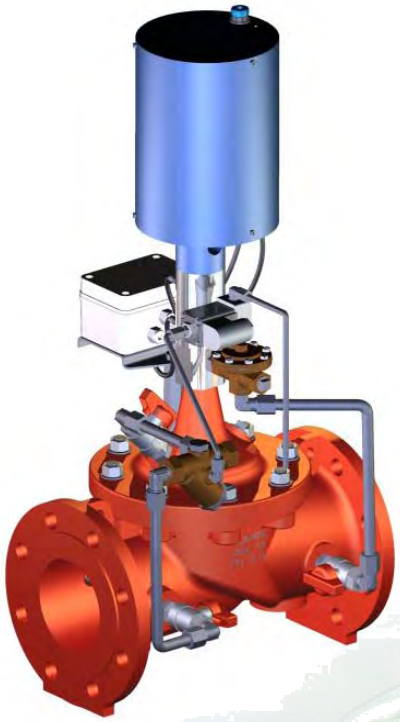
Fluid Handling Solutions:
Automatic Control Valves

CLA-VAL CPC 138-01

Technical Documentation



- Engineering Capabilities
- Industry Experience
- Certification & Approvals
- Typical Applications
- Global Operations
- Markets & Applications

Table of Contents

- Main Function & Application
- Schematic Diagram
- Operating Data
- Main Valve Description
- Dimensions
- Installation & Maintenance
- Controls & Accessories
- Valve Specification Form

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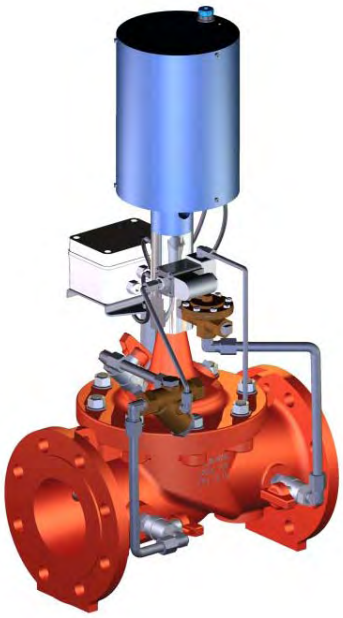
CLA-VAL **CPC 138-01**

Position Control Valve 4-20 mA

Simple, Reliable and Accurate

- **Completely Automatic Operation**
- **Easy Adjustment and Maintenance**
- **Quality Approved Materials**
- **World Wide Support**

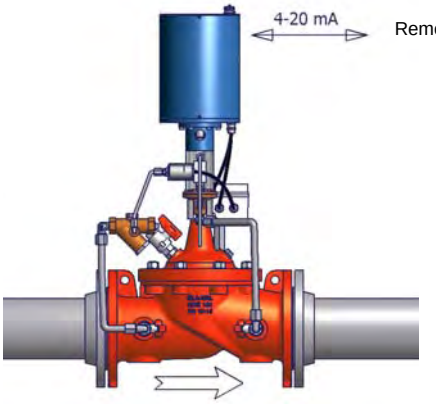
CPC



The CLA-VAL SERIES CPC is a range of Electronic Actuated Pilot control Valves that combine precise control of field proven CLA-VAL hydraulic pilots with a simple electronically actuated motor.

The CLA-VAL SERIES CPC valves, include a hydraulic pilot and integral controller which accepts a remote set-point command input to make smooth adjustments to the pilot.

CLA-VAL SERIES CPC Main Function

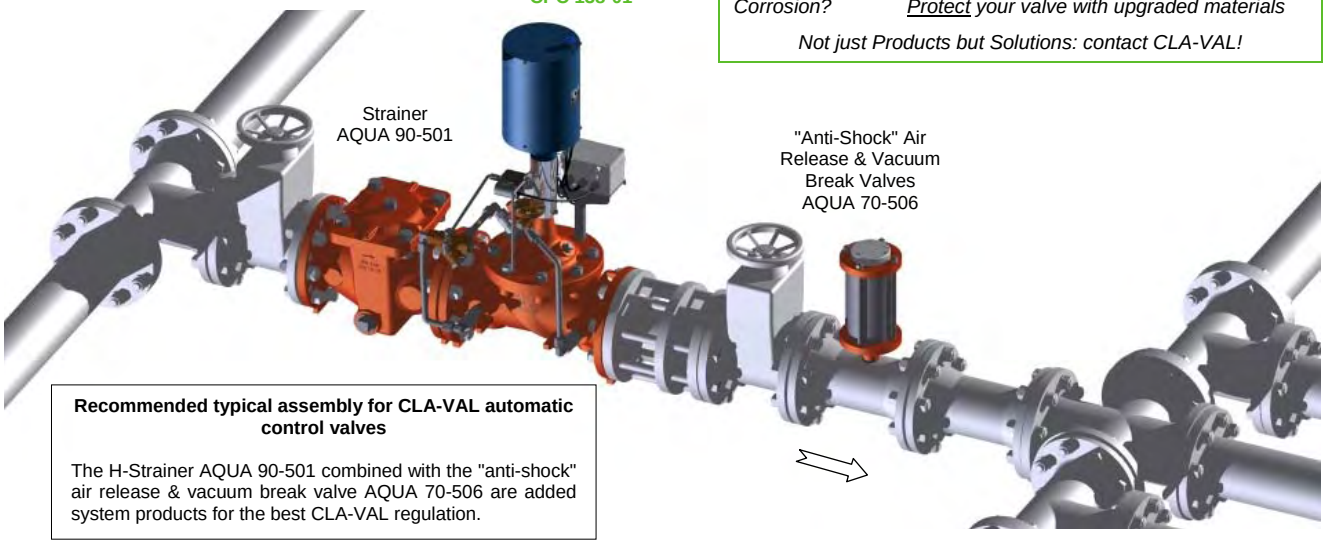


CLA-VAL CPC 138-01 Typical Application

The CLA-VAL CPC 138-01 is designed as a direct acting valve for opening/closing or regulating a pressure, flow or level.

The simple remote changing (4-20 mA analog) of valve set-point is suitable for many applications where the process variable is monitored separately and a SCADA or similar remote control system provides valve control.

CLA-VAL CPC 138-01



Recommended typical assembly for CLA-VAL automatic control valves

The H-Strainer AQUA 90-501 combined with the "anti-shock" air release & vacuum break valve AQUA 70-506 are added system products for the best CLA-VAL regulation.

Make your Valve even Better!

LFS Option?	*Control Low flows or night flows*
KO Option?	*Extend valve life with Anti-Cavitation trim*
KG1 Option?	*Use stem cleaning for harsh water*
Maintenance?	*Check on periodic maintenance*
Environment?	*Adapt to high temperatures or frost risk*
Security?	*Add hydraulic safety back-up to your valve*
Protection?	*Remove excessive system overpressures*
Corrosion?	*Protect your valve with upgraded materials*

Not just Products but Solutions: contact CLA-VAL!

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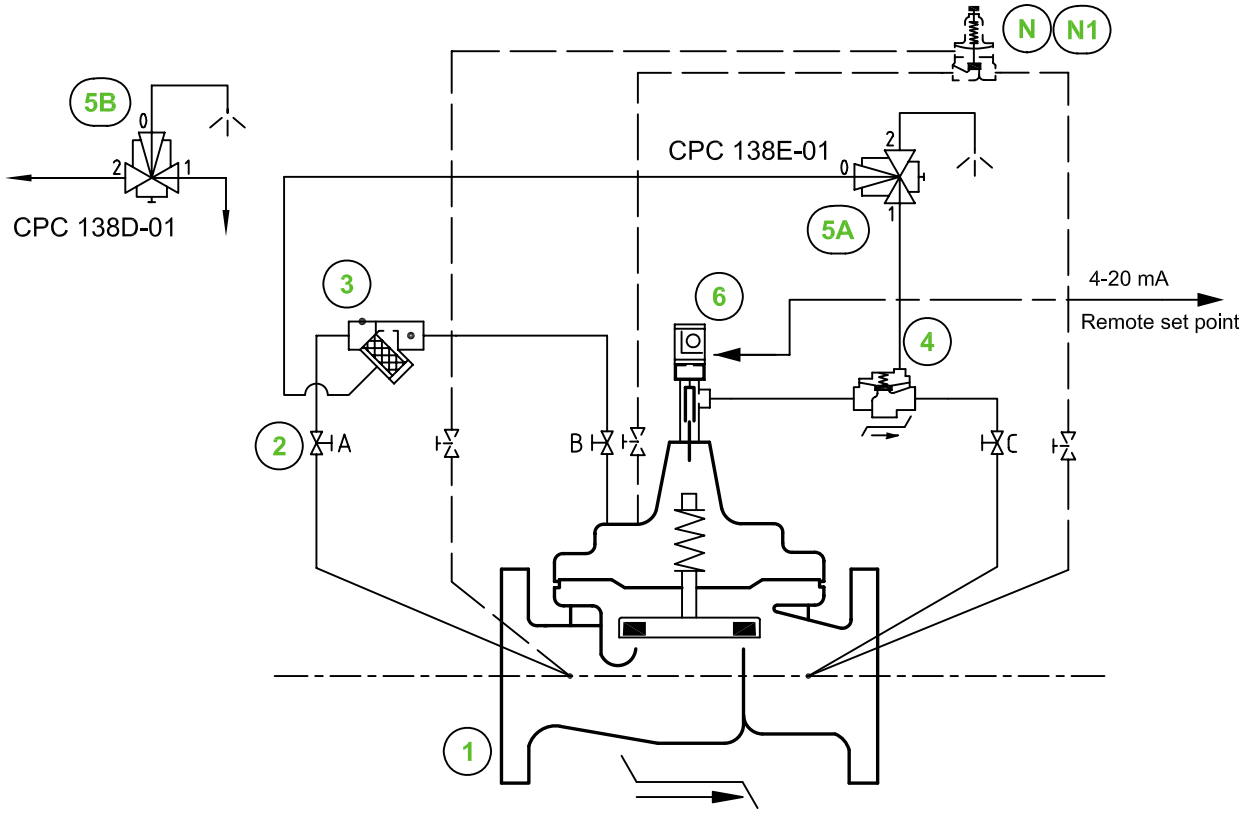
CLA-VAL **CPC 138E/D-01**

Position Control Valve 4-20 mA



STANDARD EQUIPMENT			
No	**Description**	**Qty**	**Type**
1	MAIN VALVE HYTROL AE/GE/NGE	1	100-01/KN
2	ISOLATION BALL VALVE	3	RB-117
3	STRAINER WITH INCORPORATED ORIFICE	1	X44-A
4	AUXILIARY VALVE HYTROL	1	100-KHR
5A	3-WAY SOLENOID VALVE (NO)	1	311-D
5B	3-WAY SOLENOID VALVE (NC)	1	311-C
6	POSITION CONTROL ACTUATED	1	e-CPC

OPTIONAL FEATURES			
No	**Description**	**Qty**	**Type**
N	UPSTREAM SURGE CONTROL (DRAIN TO ATMOSPHERE)	1	CRL
N1	UPSTREAM SURGE CONTROL	1	CRL

NOTES

AE/GE : DN 50 - DN 300 / NGE : DN 65 - DN 400

Wiring schematic : CPC-1

OPTIONAL FEATURES : —— —— —— ——

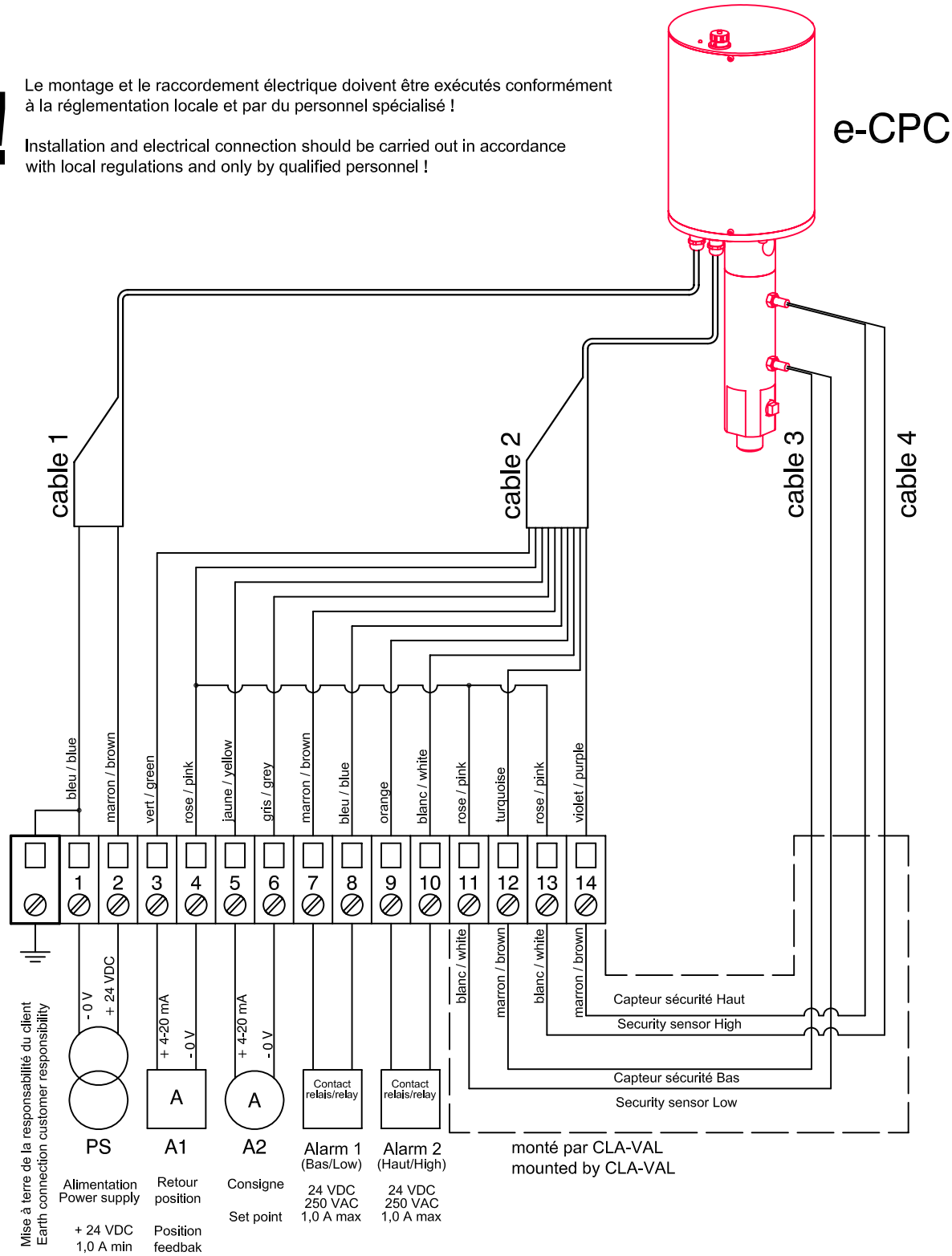
NOT FURNISHED BY CLA-VAL : —— – —— – ——

CLA-VAL **CPC-1**

Câblage électrique pour positionneur motorisé e-CPC
Wiring Schematic for Position Control Actuated e-CPC

! Le montage et le raccordement électrique doivent être exécutés conformément à la réglementation locale et par du personnel spécialisé !

Installation and electrical connection should be carried out in accordance with local regulations and only by qualified personnel !



☒ S ☐ M ☐ L
Boîtier de jonction
Junction box

Jonction électrique
Electric junction

Pas de connexion
No connection

Entrée CLIENT
CUSTOMER Input

Sortie CLA-VAL
CLA-VAL Output

Electrovanne
Solenoid

CLA-VAL CPC

Actuated Position Control 4-20 mA

Simple, Reliable and Accurate

- **Key Points and Description**

- **Accurate 4-20 mA Position Control Actuator**
- **Pressure, Level or Flow Control**
- **Easy interfacing to SCADA 4-20 mA**
- **Submersible (IP-68)**
- **Extended Electronic Protection**
- **Motor 24 VDC and powered with only 6 W!**

The CLA-VAL CPC SERIES includes all valves with the Electronic Position Actuator. CPC provides accurate remote 4-20 mA set-point adjustments and can adjust pressure, flow or even reservoir level by positioning the valve precisely and smoothly between the fully closed and the fully open position.

Used for large water supply systems, transport pipelines or industrial applications the CLA-VAL CPC position control is a Hydraulic Actuator combined with Electronic « brushless » Motor Technology.

The CPC Actuator adjusts valve operating position by controlling its lift, using hydraulic forces present in the main valve, it creates a balance between inlet, outlet and cover chamber pressure. Valve inlet water pressure enters in the valve cover chamber through a calibrated fixed orifice. Water flows out of cover chamber to valve outlet through the stem tube and a variable orifice as illustrated in (Fig. 1). The variable orifice size is adjusted only by the CPC orifice coupling (coloured brown on Fig. 1) by the «brushless» motor, inducing the opening or the closing of the main valve. The single positioning of the orifice coupling is completely independent of the main valve diaphragm assembly and will produce identical positioning of the main valve diaphragm assembly, regardless of the system pressure.

As shown in (Fig. 1) there is no mechanical link between the orifice coupling and the valve stem, which are operating as a servo-piston unit. Consequently the «brushless» motor provides frictionless operation together with a very low power consumption of 6 W to move (at an adjustable speed) the orifice coupling up or down to reach any prescribed valve position, Security sensors and loss signal mode are integrated in the motor assembly.

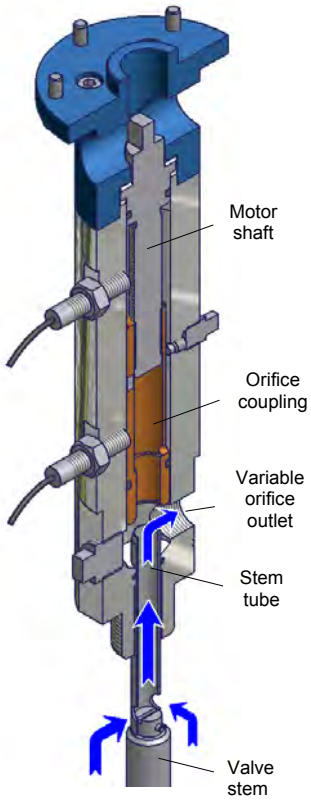


Fig. 1

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CLA-VAL CPC

Actuated Position Control 4-20 mA

How does a Hydraulically Balanced Actuator Regulate?

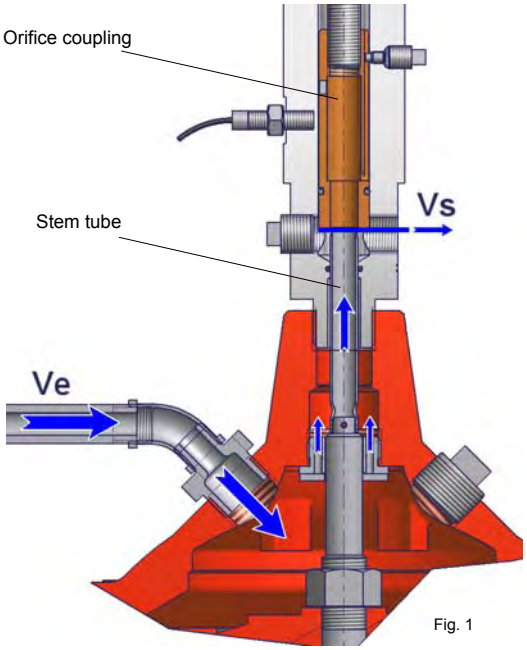

Fig. 1

Valve Closing (Fig. 1)

The «brushless» motor drives the orifice coupling downwards towards the requested set point which in turn decreases the variable orifice size. Subsequently less and less water discharges from the cover chamber to the valve outlet **(Vs)**. Water flowing from the valves inlet port **(Ve)** enters the valve cover chamber via the calibrated fixed orifice which becomes increasingly greater than **Vs** generating the downward motion of the diaphragm assembly. This closes the valve to the prescribed set point corresponding to the analogical [4-20 mA] signal transmitted to the «brushless» motor. The displacement of water from the main valve diaphragm assembly is performed purely hydraulically, and there is no mechanical connection between the orifice coupling and the valve stem.

In the set position, the inlet water **Ve** balances the discharge water **Vs**, which explains why any in-balance between these two values permits an immediate and smooth reaction which delivers a smooth motion of the internal diaphragm assembly.

In the completely closed position, the leakage created by the mechanical tolerance between the orifice coupling and the stem tube is stopped drip tight at the outlet of the Electronic Position Actuator CPC by a separate solenoid valve installed in its discharge line.

Valve Opening (Fig. 2)

The «brushless» motor drives the orifice coupling upwards to the requested set point which in turn increases the variable orifice size. Subsequently, more and more water is discharged from the main valve cover chamber to the valve outlet **(Vs)**. Water entering into the valve cover **Ve** via the calibrated orifice is not compensating for the water leaving the top cover via **Vs.** This permits the diaphragm assembly to move upwards which opens the valve to the prescribed set-point corresponding to the analogical [4-20 mA] signal transmitted to the «brushless» motor. The displacement of the main valve diaphragm assembly is performed purely hydraulically, since there is no mechanical connection between the orifice coupling and the valve stem.

In the set position, the inlet water **Ve** is balancing the water discharged via **Vs**, which explains why any in-balance between these two values permits an immediate and smooth reaction which delivers a smooth motion of the internal diaphragm assembly.

Due to these CLA-VAL features both pressure differential values [valve inlet ⇒ cover chamber] or [cover chamber ⇒ valve outlet] are identical therefore any change of pressure in the system does not affect the set position of the main valve.

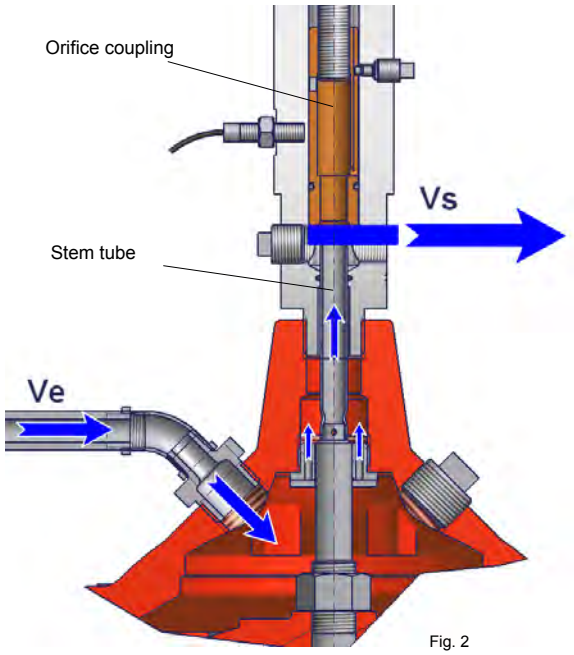

Fig. 2

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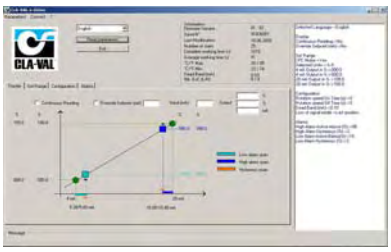
CLA-VAL CPC

Actuated Position Control 4-20 mA

Actuated Position Control 4-20 mA features

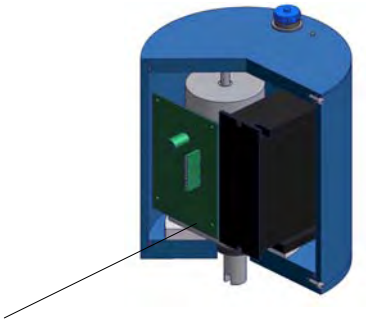
Design: The CLA-VAL CPC Actuated Position Control is designed for continuous position control.
The CLA-VAL CPC can be assembled on all CLA-VAL valves up to GE300/NGE400 with specific speed adjustment. Refer to specific datasheet for more information.



Software: User friendly CLA-VAL Calibration Software provides simple to program control features. 4-20 mA range settings are directly entered to match desired flow or level values. The graphic interface is self explanatory and offers a very simple way to calibrate precise control values.

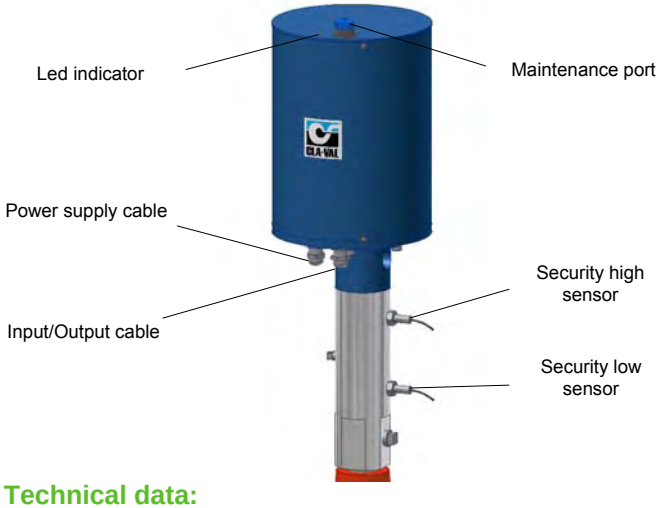
Internet Updates: All software updates are free and available on the CLA-VAL web site.

PC Connection: Plugged directly in your PC USB port or by Bluetooth e-Drive parameters and data are instantly accessible through the calibration software.



PCB (Printed Circuit Board): Is build with the latest technologies including high quality components. The input is insulated (2 wires) and isolated to protect against signal interference (common mode rejection up to 1000 V). A resettable fuse is used to protect against over voltage / reverse polarity. To prevent condensation (humidity protection), heater starts when internal temp falls below 5°C, the PCB includes also tropical coating for moisture protection. The position low and high is protected automatically cuts power to prevent mechanical damage without loss of original calibration. The Brushless motor is made for continuous duty, higher efficiency and reliability.

MEXUSB20401A cable and MEXUSBADAPT is required for programming and monitoring



Technical data:

Electrical Specifications	
Electrical Power:	• 24 VDC, 6 / 10 / 15 rpm / sizes 300 mA max. load draw 85 mA stand-by (no load draw)
Power Protection:	Max. 32 VDC over voltage Max. 1000 mA torque load Reverse polarity & short circuit 80°C stop @ high temperature
Led display:	Green led
Electrical connection:	2 x Moulded 10 m cables
Input command:	• 4-20 mA (2 wires) • 2x dry contact (contact security)
Input 4-20 mA Protection:	Max. 32 VDC over voltage Optocoupler isolation @ CMR 1000 V (CMR: common mode rejection) Insulated (2 wires)
Output feedback:	• 4-20 mA (Output charge ≤ 500 Ω) • 2 x programmable position alarms 24 VDC / 240 VAC up to 1 A max.
Output 4-20 mA Protection:	Max. 32 VDC over voltage (The input dry contact and 4-20 mA output have the same common or earth but are not individually isolated)
Other Specifications	
Sizes:	GE 50 - 300 / NGE 80 - 400
Operating Pressure:	PN 16 bar standard
Temperature range:	-10°C to +80°C.
Rating:	IP68 standard allowing full immersion (solenoid, junction box, sensor, not included in IP68)
Interface:	Plug & Play / NT / 2000 / XP / Vista / Win 7
Default mode	
Troubleshooting:	Refer to user manual for LED diagnostics and codes: red-green-blinking
Remote command failure:	Options available: maintain current position, go to 4 mA position, go to 20 mA position

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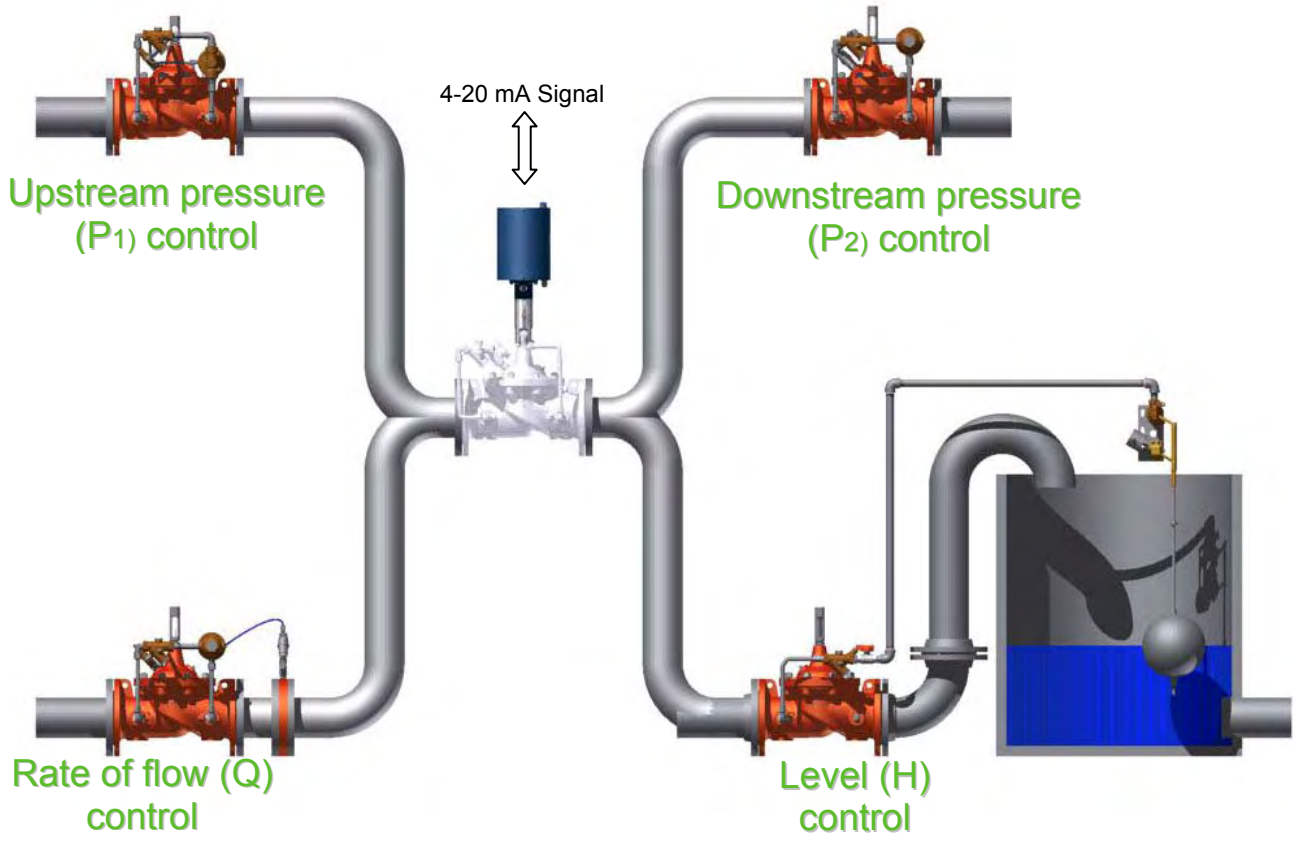
CLA-VAL CPC

Actuated Position Control 4-20 mA

4 Typical applications of the CLA-VAL series CPC



The CLA-VAL CPC SERIES receives a remote analogical signal [4-20 mA] over a SCADA system or equivalent. This signal will act directly on the «brushless» motor, which will drive the orifice coupling until it reaches its corresponding set value.

The CPC Actuator is particularly recommended if the user intends to apply a hydraulically operated control whilst maintaining the flexibility to change its respective set value at anytime. The applications are numerous considering the various parameters of a hydraulically operated system, whose four key applications are illustrated above and can be listed as follows :

Inlet pressure control - Outlet pressure control - Rate of flow control - Level control

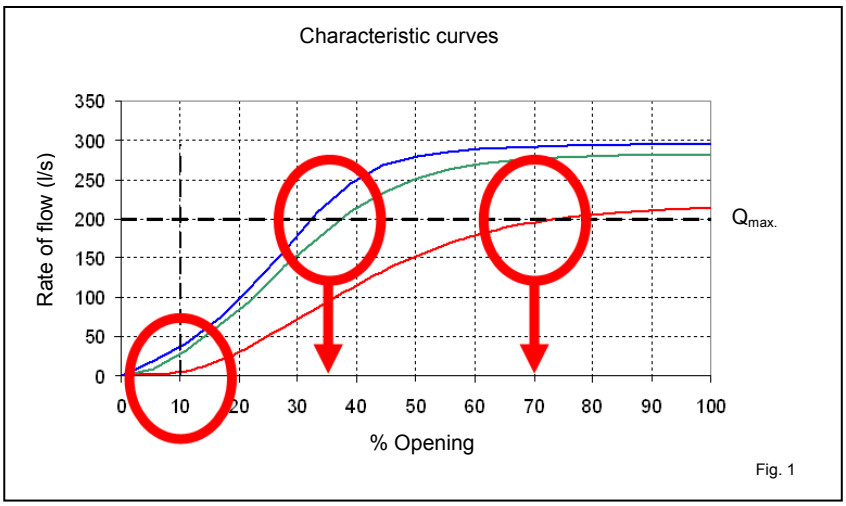


Fig. 1

The CLA-VAL CPC main valve offers a characteristic curve extremely well adapted to a regulating process within a SCADA supervision system.

In fact Fig. 1 illustrates the characteristic curves of a butterfly (green) and ball (blue) valve, as well as the one of the CPC (red) main valve. This demonstrates that the CLA-VAL CPC curve offers on one hand a **much wider regulating range** than the two other and on the other hand a **low opening value at small rate of flow**. These two conditions are the key factors for any progressive, accurate and sensible regulating operation which allows the CLA-VAL CPC to offer such a wide application range.

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CLA-VAL CPC

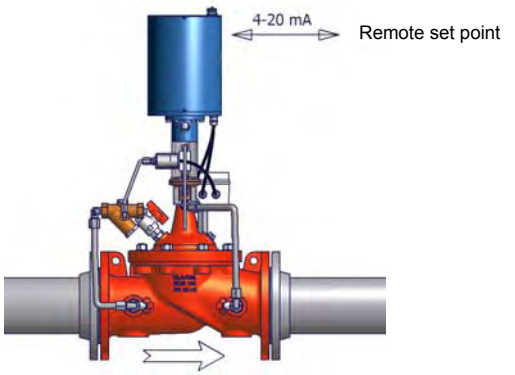
Actuated Position Control 4-20 mA

4 Typical applications for the SERIES CLA-VAL CPC

Remote Set Point

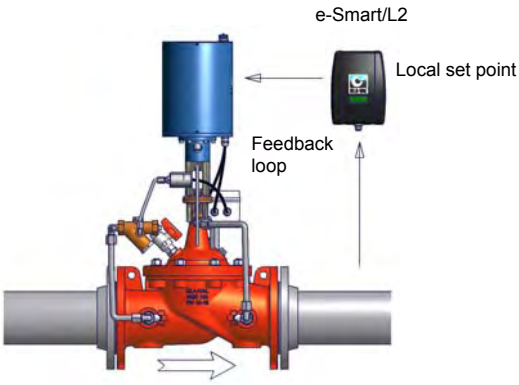
The CPC actuator receives an analogical signal (4-20 mA) from a SCADA system and automatically adjusts the «brushless» motor until the valves position reaches the prescribed set point.

The CPC actuator is particularly recommended for applications where the user wishes to keep a hydraulically operated system with the ability to change the set-point of the valve. Applications are numerous depending on the types of the parameters chosen.



Local Set Point

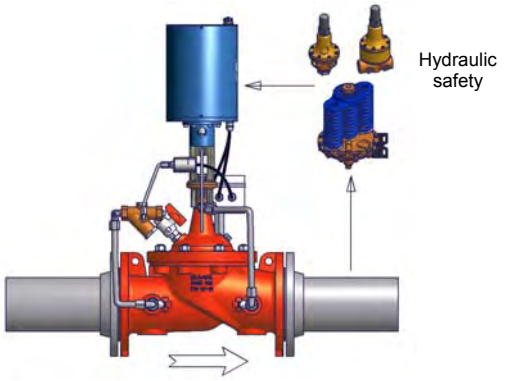
The CPC Actuator working together with an e-Smart/L2 electronic controller provides automatic control of the system. E-Smart/L2 compares local feed-back signal with pre-programmed conditional set-points and adjusts the valves position automatically until set-point is reached.



Hydraulic Safety

In most CPC Actuator applications, it is possible to secure its operation during electrical power failure by additional hydraulically operated CLA-VAL pilot(s) which are added to its pilot circuit. These allow the valve to maintain a safety value. E.g Pressure reducing, pressure sustaining or maximum rate of flow until power is restored.

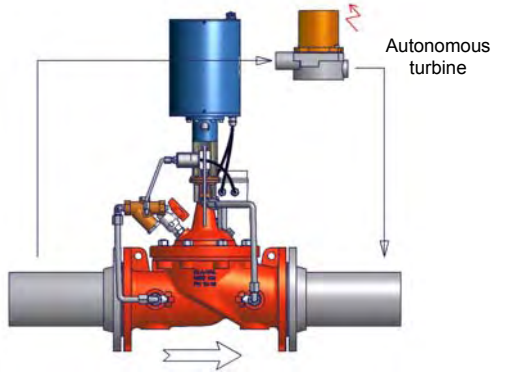
The above combination offers the advantage of not only controlling the valve in the event of electrical power failure, but to increase the flexibility of the CPC Actuator application, by adding to the basic operation other hydraulically operated functions. These additional features for the SERIES CLA-VAL CPC are highly appreciated in applications where other variables have to be regulated during power failure.



Autonomous Turbine

A particular feature of the CPC Actuator is its very low power consumption with a voltage of 24 VDC. CLA-VAL has therefore taken advantage of this and developed an autonomous turbine hydraulically installed as bypass of the CPC Actuator operated valve. The turbine can feed the CPC Actuator electrical motor and eventually any other low power users, as transmission of data or specific information.

The autonomous turbine, is mounted in bypass of the valve, is producing 0,5 A at 24 VDC and works in parallel with a battery, permitting actuation of the CPC motor.



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CLA-VAL **100-01 NGE**

Main Valve HYTROL

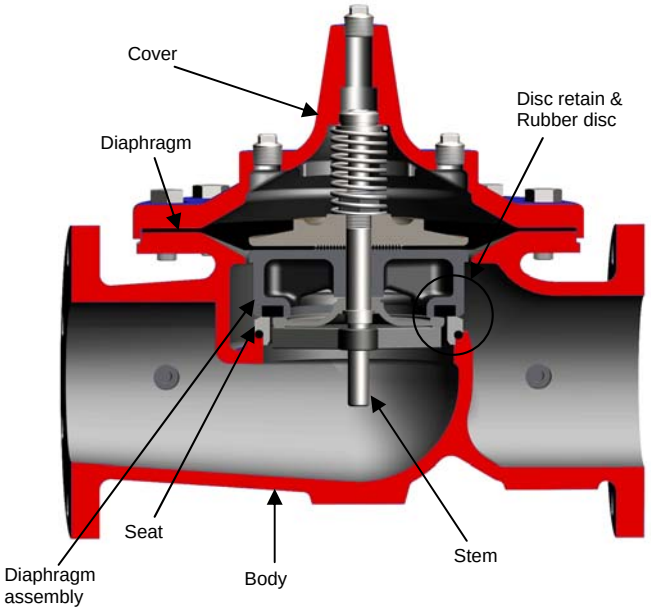
Simple, Reliable and Accurate

CLA-VAL SERIES 100 Main Function

The CLA-VAL 100-01 HYTROL Valve is a hydraulically operated, diaphragm actuated, globe or angle pattern valve.
It consists of three major components: body, diaphragm assembly and cover. The diaphragm assembly is the only moving part, guided top and bottom by a precision machined stem. The disc retainer and rubber disc form a drip-tight seal with the renewable seat when pressure is applied above the diaphragm (cover chamber).
The CLA-VAL 100-01 is the basic valve used in nearly in all CLA-VAL Automatic Control Valves.

There are 3 HYTROL body types:

NGE: New Globe Execution
GE: Globe Execution
AE: Angle Execution

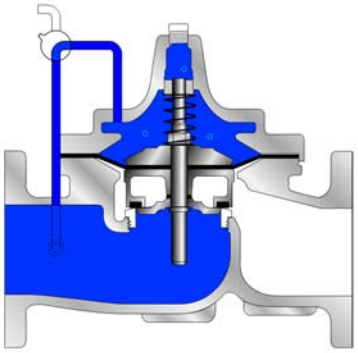


CLA-VAL 100-01 Principle of Operation

On/Off Control

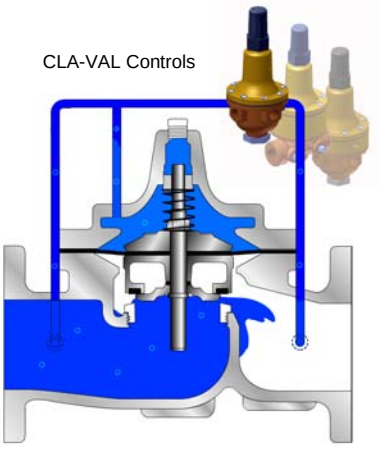
Full Open Operation:
When pressure in the cover chamber is relieved to a lower pressure or to atmosphere, the pressure inlet opens the valve.

On/Off Control



Tight Closing Operation:
When pressure from the inlet pressure is applied to the cover chamber, the valve closes drip-tight.

CLA-VAL Controls



Modulating Control:
The valve is pressure operating balanced. The CLA-VAL "Modulating" Controls will allow the valve to automatically compensate for pressure changes.

Usual Main Valves

HYTROL Main Valve / HYTROL NGE-316	100-01
TYTAN Main Valve	100-01
HYTROL Auxiliary Valve	000130TT
ROLL SEAL Main Valve	100-42
DELUGE Main Valve	100G

More Information

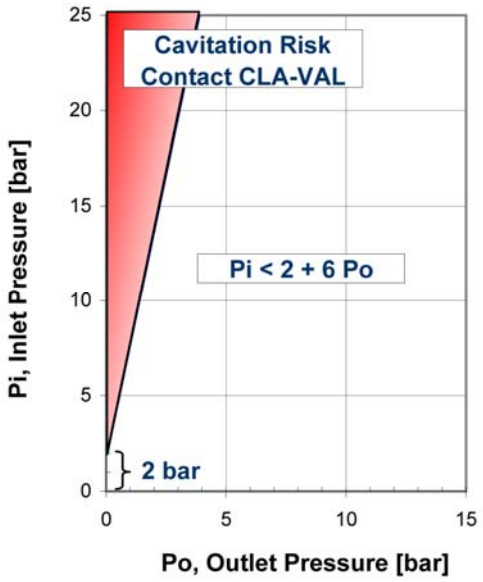
		Sheet #
☑	Schematic Diagram	HYN001TT
☑	Quick Valve Selection	000121DE
☑	Dimensions	000122DE-1
☑	Pressure Ratings & Materials	000123DE

Other Functions : Please Contact CLA-VAL

CLA-VAL **100-01 NGE**

Quick Valve Selection

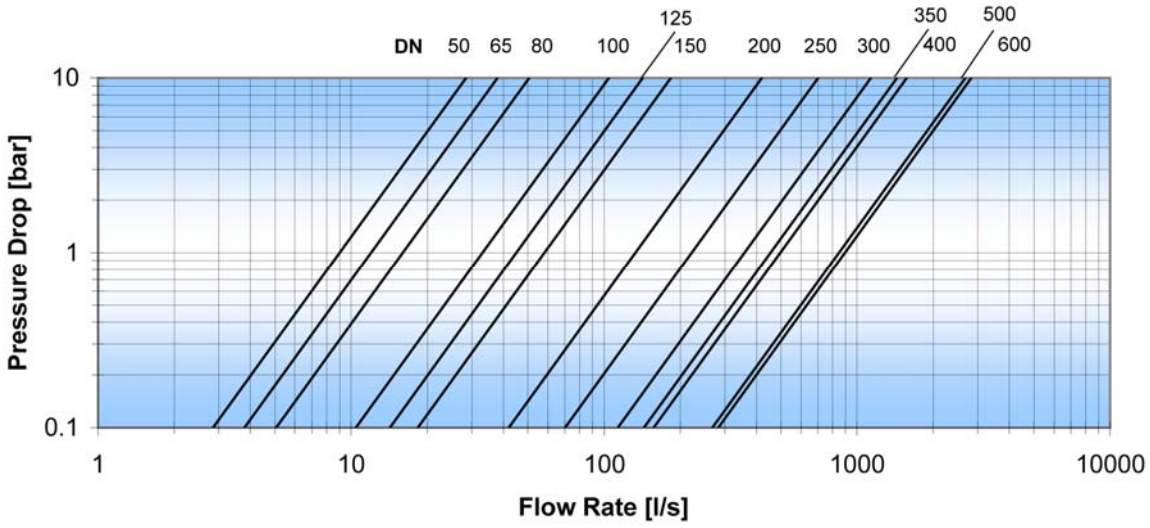
Cavitation / Flow Chart



- **Valve Sizing Example**

Pipe Diameter : 100 [mm]
Peak Flow : 20 [l/s]
} **NGE DN 100 [mm]**

Inlet Pressure : 15 [bar]
Outlet Pressure : 5 [bar]
} **Below Cavitation Risk**



Notes

- Diagram to be used as a guide only.

More Information

		Sheet #
☑	Quick Valve Selection	000121DE
☑	Sizing Software	Run CLA-VAL Softwares

To obtain a more accurate calculation please contact CLA-VAL

CLA-VAL **100-01 NGE**

Quick Valve Selection

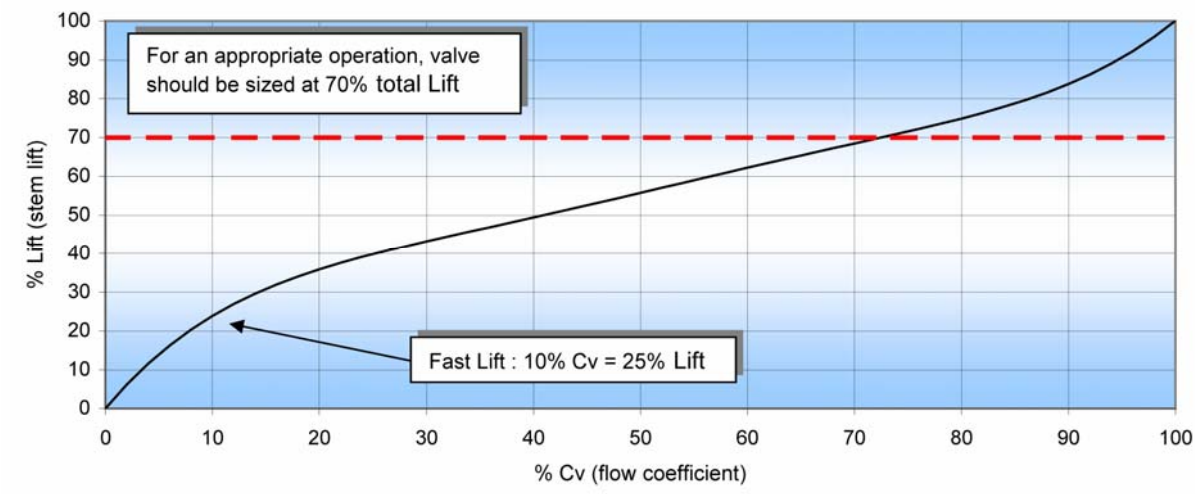
Performance Chart

Flanged [mm] DN	32	40	50	65	80	100	125	150	200	250	300	350	400	450	500	600
Screwed [in] DN	1 1/4"	1 1/2"	2"	2 1/2"	3"	-	-	-	-	-	-	-	-	-	-	-
Hytrol NGE																
Kv (m3/h)	-	-	32	43	58	119	162	209	479	799	1292	1638	1789	2298	3049	3222
Cv (l/s) @ 1 bar	-	-	9	12	16	33	45	58	133	222	359	455	497	638	847	895
ζ (-)	-	-	9.5	15.3	19.8	11.3	14.9	18.6	11.2	9.8	7.8	8.9	12.8	12.4	10.8	20.0
Normal Flow (l/s)																
@ velocity 1 m/s			1.6	2.7	4	6	10	14	25	39	56	77	100	127	157	226
	-	-	to	to	to	to	to	to	to	to	to	to	to	to	to	to
@ velocity 3 m/s			6	10	15	24	37	53	94	147	212	289	377	477	589	848
Max. Flow (l/s)																
Continious @ v=4 m/s	-	-	8	13	20	31	49	71	126	196	283	385	502	636	785	1130
Intermittent @ v=5.5 m/s	-	-	11	18	28	43	67	97	173	270	389	529	691	874	1079	1554

$$Q = Kv\sqrt{\Delta p}$$
$$Q = Cv\sqrt{\Delta p}$$
$$\Delta H = \zeta \frac{v^2}{2g}$$

Q : rate of flow (m3/h)
Kv : flow coefficient (m3/h)
Cv : flow coefficient (l/s)
Δp : head loss (bar)

ΔH : head loss (m)
v : average pipe velocity (m/s)
g : gravitational constant (9.81m/s2)
ζ : resistance coefficient (-)



Notes

- Kv or Cv = m3/h or l/s @ 100kPa (1 bar) head loss with 15°C water (valve totally open).
- Minimum Opening Pressure: 0,2 [bar].
- Minimum Differential Pressure: 0,5 [bar].

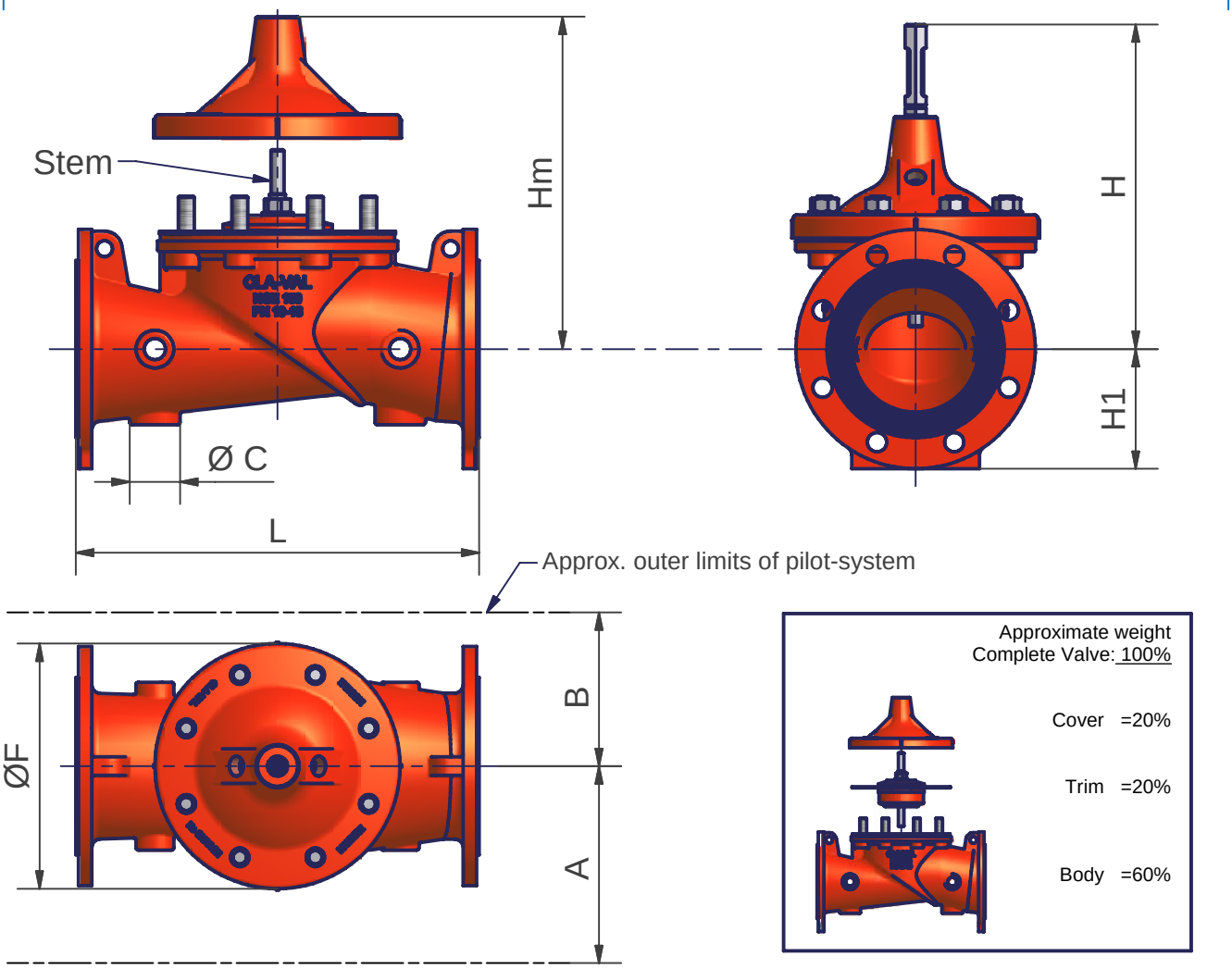
More Information

		Sheet #
☑	Quick Valve Selection	000121DE
☑	Sizing Software	Run CLA-VAL Softwares

For lower opening Pressure or differential pressure, please contact CLA-VAL

CLA-VAL **100-01 NGE**

Dimensions



▶ Technical Data:

Flanged (mm)	DN 50	DN 65	DN 80	DN 100	DN 125	DN 150	DN 200	DN 250	DN 300	DN 350	DN 400	DN 450	DN 500	DN 600
L	230	290	310	350	400	480	600	730	850	980	1100	1200	1250	1450
F	145	170	170	235	295	295	400	510	600	712	712	712	900	900
H	195	225	230	305	365	375	460	547	695	821	821	900	1035	1035
H1 (PN10)	82.5	93	100	110	125	142.5	170	200	227.5	252.5	282.5	325	370	430
H1 (PN16)	82.5	93	100	110	125	142.5	170	200	227.5	260	290	325	370	430
H1 (PN25)	82.5	93	100	117.5	135	150	180	212.5	242.5	277.5	310	335	370	430
Hm	255	295	300	390	470	480	585	700	875	1030	1030	1200	1310	1310
A	190	200	200	200	235	250	270	290	365	400	425	450	520	520
B	145	150	150	160	160	165	200	200	345	385	380	420	460	460
øC	45	60	60	60	60	80	80	80	80	80	80	80	-	120
Weight (Kg)	15	20	25	40	60	70	120	190	330	540	640	700	980	1060

▶ Hydraulic Data:

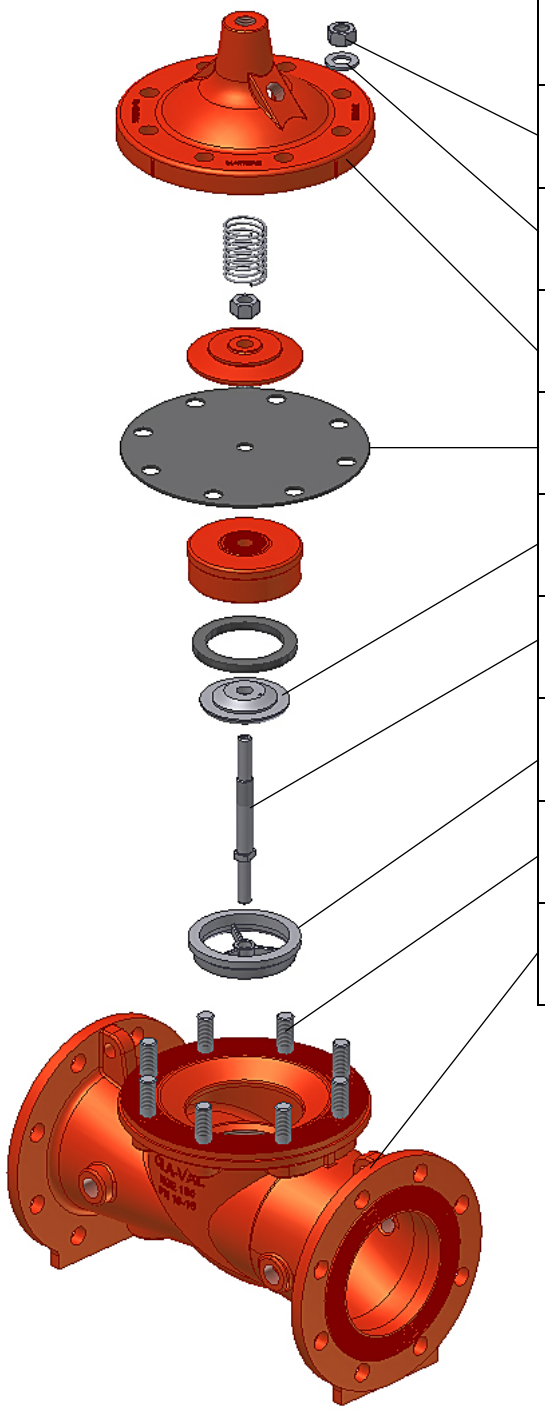
Flanged (mm)	DN 50	DN 65	DN 80	DN 100	DN 125	DN 150	DN 200	DN 250	DN 300	DN 350	DN 400	DN 450	DN 500	DN 600
Kv (m3/h)	32	43	58	119	162	209	479	799	1292	1638	1789	2070	3049	3222
Cv (l/s)	9	12	16	33	45	58	133	222	359	455	497	575	847	895

Kv or Cv = m3/h or l/s @ 100kPa (1 bar) head loss with 15°C water (valve totally open).

CLA-VAL **100-01 NGE**

Pressure Ratings & Materials
PN10 - PN16 - PN25

DN 50 to DN 600



Standard Materials		
(3)	Stud nut	Stainless Steel
(29)	Washer	Stainless Steel
(6)	Cover	Ductile Iron
(9)	Diaphragm	Reinforced Rubber
(11)	Disc guide	Stainless Steel
(14)	Stem	Stainless Steel
(15)	Seat	Stainless Steel
(4)	Stud	Stainless Steel
(16)	Body	Ductile Iron

- Other Pressure Rating on request: PN 40, ANSI 150, ANSI 300.
- Standard epoxy coating minimum 250 microns.
- Auxiliary Valve HYTROL 3/8'', 1/2'', 3/4'', 1'' see 000130TT.

CLA-VAL **100-01**

Installation - Operation - Maintenance
NGE - GE - AE

DESCRIPTION

The CLA-VAL Model 100-01 HYTROL Valve is a main valve for CLA-VAL Automatic Control Valves. It is a hydraulically operated, diaphragm-actuated, globe or angle pattern valve.

This valve consists of three major components; body, diaphragm assembly, and cover. The diaphragm assembly is the only moving part. The diaphragm assembly uses a diaphragm of nylon fabric bonded with synthetic rubber. A synthetic rubber disc, contained on three and one half sides by a disc retainer and disc guide, forms a seal with the valve seat when pressure is applied above the diaphragm. The diaphragm assembly forms a sealed chamber in the upper portion of the valve, separating operating pressure from line pressure.

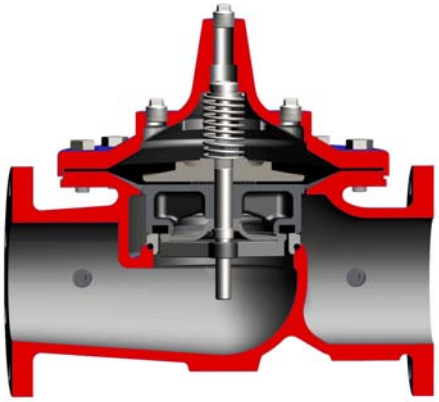


Illustration type GE

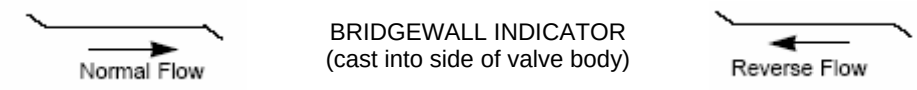
INSTALLATION

1. Before valve is installed, pipe lines should be flushed of all chips, scale and foreign matter.
2. It is recommended that either gate or block valves be installed on both ends of the 100-01 HYTROL Valve to facilitate isolating the valve for preventive maintenance and repairs.
3. Place the valve in the line with flow through the valve in the direction indicated on the inlet nameplate. (See “Flow Direction” Section)
4. Allow sufficient room around valve to make adjustments and for disassembly.
5. CLA-VAL 100-01 HYTROL Valves operate with maximum efficiency when mounted in horizontal piping with the cover UP, however, other positions are acceptable. Due to size and weight of the cover and internal components of 8 inch and larger valves, installation with the cover UP is advisable. This makes internal parts readily accessible for periodic inspection.
6. Caution must be taken in the installation of this valve to insure that galvanic and/or electrolytic action does not take place. The proper use of dielectric fittings and gaskets are required in all systems using dissimilar metals.
7. If a pilot control system is installed on the 100-01 HYTROL Valve, use care to prevent damage. If it is necessary to remove fittings or components, be sure they are kept clean and replaced exactly as they were.
8. After the valve is installed and the system is first pressurized, vent air from the cover chamber and pilot system tubing by loosening fittings at all high points.

FLOW DIRECTION

The flow through the 100-01 HYTROL Valve can be in one of two directions. When flow is “up-and-over the seat,” it is in “normal” flow and the valve will fail in the open position. When flow is “over the seat-and down,” it is in “reverse” flow and the valve will fail in the closed position. There are no permanent flow arrow markings.

The valve must be installed according to nameplate data.



RECOMMENDED TOOLS

1. Three pressure gauges with ranges suitable to the installation to be put at HYTROL inlet, outlet and cover connections.
2. CLA-VAL Model X101 Valve Position Indicator. This provides visual indication of valve position without disassembly of valve.
3. Other items are: suitable hand tools such as screwdrivers, wrenches, etc. soft jawed (brass or aluminum) vise 400 grit wet or dry sandpaper and water for cleaning.

CLA-VAL **100-01**

Installation - Operation - Maintenance
NGE - GE - AE

PRINCIPLES OF OPERATION

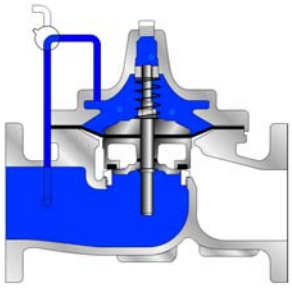
(Illustration type GE)

On/Off Control

Tight Closing Operation

When pressure from the valve inlet (or an equivalent independent operating pressure) is applied to the diaphragm chamber the valve closes drip-tight.

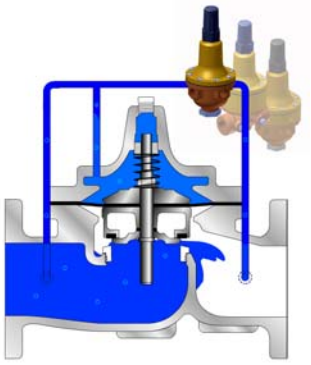
On/Off Control



Full Open Operation

When pressure in diaphragm chamber is relieved to a zone of lower pressure (usually atmosphere) the line pressure (5 psi Min.) at the valve inlet opens the valve.

CLA-VAL control



Modulating Action

Valve modulates when diaphragm pressure is held at an intermediate point between inlet and discharge pressure. With the use of a CLA-VAL. "modulating control," which reacts to line pressure changes, the pressure above the diaphragm is varied, allowing the valve to throttle and compensate for the change.

THREE CHECKS

The 100-01 HYTROL Valve has only one moving part (the diaphragm and disc assembly). So, there are only three major types of problems to be considered.

First: Valve is stuck - that is, the diaphragm assembly is not free to move through a full stroke either from open to close or vice versa.

Second: Valve is free to move and can't close because of a worn out diaphragm.

Third: Valve leaks even though it is free to move and the diaphragm isn't leaking.

CAUTION! Care should be taken when doing the troubleshooting checks on the 100-01 HYTROL Valve. These checks do require the valve to open fully. This will either allow a high flow rate through the valve, or the downstream pressure will quickly increase to the inlet pressure. In some cases, this can be very harmful. Where this is the case, and there are no block valves in the system to protect the downstream piping, it should be realized that **the valve cannot be serviced under pressure.** Steps should be taken to remedy this situation before proceeding any further.

Valve size (DN)		COVER CHAMBER CAPACITY (liquid Volume displaced when valve opens)		STEM TRAVEL (Fully Open To Fully closed)	
NGE	**GE**	**Liters**	**Gallons**	**mm**	**Inches**
50	32 - 40	0,07	0,020	10,0	0,40
65 & 80	50	0,12	0,032	15,0	0,60
	65	0,16	0,043	18,0	0,70
100	80	0,30	0,080	20,0	0,80
125 & 150	100	0,64	0,169	28,0	1,10
200	150	2,00	0,531	43,0	1,70
250	200	4,80	1,260	58,0	2,30
300	250	9,50	2,510	71,0	2,80
350 & 400	300	15,10	4,000	86,0	3,40
	350	24,60	6,500	100,0	4,00
500 & 600	400	36,20	9,570	114,0	4,50
TYTAN		**Liters**	**Gallons**	**mm**	**Inches**
TYTAN-S	600 - 800	107,00	28,27	154,6	6,0
TYTAN-M	900 - 1000	159,00	42,00	190,0	7,5
TYTAN-L	900 - 1200	340,00	90,00	216,0	8,5

DIAPHRAGM CHECK (#1)

1. Shut off pressure to the HYTROL Valve by slowly closing upstream and downstream isolation valves. **SEE CAUTION!**.
2. Disconnect or close all pilot control lines to the valve cover and leave only one fitting in highest point of cover open to atmosphere.
3. With the cover vented to atmosphere, slowly open upstream isolation valve to allow some pressure into the HYTROL Valve body. Observe the open cover tapping for signs of continuous flow. It is not necessary to fully open isolating valve. Volume in cover chamber capacity chart will be displaced as valve moves to open position. Allow sufficient time for diaphragm assembly to shift positions. If there is no continuous flow, you can be quite certain the diaphragm is sound and the diaphragm assembly is tight. If the fluid appears to flow continuously this is a good reason to believe the diaphragm is either damaged or it is loose on the stem. In either case, this is sufficient cause to remove the valve cover and investigate the leakage. (See “Maintenance” Section for procedure.)

FREEDOM OF MOVEMENT CHECK (#2)

4. Determining the HYTROL Valve’s freedom of movement can be done by one of two methods.
5. For most valves it can be done after completing Diaphragm Check (Steps 1., 2., and 3.). **SEE CAUTION!**. At the end of step 3. the valve should be fully open.
6. If the valve has a CLA-VAL X101 Position Indicator, observe the indicator to see that the valve opens wide. Mark the point of maximum opening.
7. Re-connect enough of the control system to permit the application of inlet pressure to the cover. Open pilot system cock so pressure flows from the inlet into the cover.
8. While pressure is building up in the cover, the valve should close smoothly. There is a hesitation in every HYTROL Valve closure, which can be mistaken for a mechanical bind. The stem will appear to stop moving very briefly before going to the closed position. This slight pause is caused by the diaphragm flexing at a particular point in the valve’s travel and is not caused by a mechanical bind.
9. When closed, a mark should be made on the X101 Valve position indicator corresponding to the “closed” position. The distance between the two marks should be approximately the stem travel shown in chart.
10. If the stroke is different than that shown in stem travel chart this is a good reason to believe something is mechanically restricting the stroke of the valve at one end of its travel. If the flow does not stop through the valve when in the indicated “closed” position, the obstruction probably is between the disc and the seat. If the flow does stop, then the obstruction is more likely in the cover. In either case, the cover must be removed, and the obstruction located and removed. The stem should also be checked for scale build-up. (See “Maintenance, section for procedure.)
11. For valves 6” and smaller, the HYTROL Valve’s freedom of movement check can also be done after all pressure is removed from the valve. **SEE CAUTION!**. After closing inlet and outlet isolation valves and bleeding pressure from the valve, check that the cover chamber and the body are temporarily vented to atmosphere. Insert fabricated tool into threaded hole in top of valve stem, and lift the diaphragm assembly manually. Note any roughness. The diaphragm assembly should move smoothly throughout entire valve stroke. The tool is fabricated from rod that is threaded on one end to fit valve stem and has a “T” bar handle of some kind on the other end for easy gripping. (See chart in Step 4 of “Disassembly” Section.)
12. Place marks on this diaphragm assembly lifting tool when the valve is closed and when manually positioned open. The distance between the two marks should be approximately the stem travel shown in stem travel chart. If the stroke is different than that shown, there is a good reason to believe something is mechanically restricting the stroke of the valve. The cover must be removed, and the obstruction located and removed. The stem should also be checked for scale build-up. (See “Maintenance, section for procedure.)

TIGHT SEALING CHECK (#3)

13. Test for seat leakage after completing checks #1 & #2 (Steps 1. to 12.). **SEE CAUTION!.** Close the isolation valve downstream of the HYTROL Valve. Apply inlet pressure to the cover of the valve, wait until it closes. Install a pressure gauge between the two closed valves using one of the two ports in the outlet side of the HYTROL. Watch the pressure gauge. If the pressure begins to climb, then either the downstream isolation valve is permitting pressure to creep back, or the HYTROL is allowing pressure to go through it. Usually the pressure at the HYTROL inlet will be higher than on the isolation valve discharge, so if the pressure goes up to the inlet pressure, you can be sure the HYTROL is leaking. Install another gauge downstream of isolating valve. If the pressure between the valves only goes up to the pressure on the isolation valve discharge, the HYTROL Valve is holding tight, and it was just the isolation valve leaking.

TROUBLESHOOTING

The following troubleshooting information deals strictly with the Model 100-01 HYTROL Valve. This assumes that all other components of the pilot control system have been checked out and are in proper working condition. (See appropriate sections in Technical Manual for complete valve).

All trouble shooting is possible without removing the valve from the line or removing the cover. It is highly recommended to permanently install a Model X101 Valve Position Indicator and three gauges in unused HYTROL inlet, outlet and cover connections.

SYMPTOM	PROBABLE CAUSE	REMEDY
Fails to close	Closed isolation valves in control system, or in main line.	Open Isolation valves.
	Lack of cover chamber pressure.	Check upstream pressure, pilot system, strainer, tubing, valves, or needle valves for obstruction.
	Diaphragm damaged. (See Diaphragm Check)	Replace diaphragm.
	Diaphragm assembly inoperative. Corrosion or excessive scale build-up on valve stem. (See Freedom of Movement Check)	Clean and polish stem. Inspect and replace any damaged or badly eroded part.
	Mechanical obstruction. Object lodged in valve. (See Freedom of Movement Check)	Remove obstruction.
	Worn disc. (See Tight Sealing Check)	Replace disc.
	Badly scored seat. (See Tight Sealing Check)	Replace seat.
Fails to open	Closed upstream and/or downstream isolation valves in main line.	Open isolation valves.
	Insufficient line pressure.	Check upstream pressure. (Minimum 5 psi flowing line pressure differential.)
	Diaphragm assembly inoperative. Corrosion or excessive build-up on valve stem. (See Freedom of Movement Check)	Clean and polish stem. Inspect and replace any damaged or badly eroded part.
	Diaphragm damaged. (For valves in "reverse flow" only)	Replace diaphragm.

After checking out probable causes and remedies, the following three checks can be used to diagnose the nature of the problem before maintenance is started. They must be done in the order shown.

MAINTENANCE

PREVENTATIVE MAINTENANCE

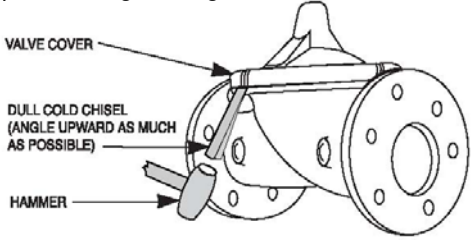
The CLA-VAL Model 100-01 HYTROL Valve requires no lubrication or packing and a minimum of maintenance. However, a periodic inspection schedule should be established to determine how the operating conditions of the system are affecting the valve. The effect of these actions must be determined by inspection.

DISASSEMBLY

Inspection or maintenance can be accomplished without removing the valve from the line. Repair kits with new diaphragm and disc are recommended to be on hand before work begins.

: Maintenance personnel can be injured and equipment damaged if disassembly is attempted with pressure in the valve. **SEE CAUTION!.**

1. Close upstream and downstream isolation valves **and independent operating pressure when used** to shut off all pressure to the valve.
2. Loosen tube fittings in the pilot system to remove pressure from valve body and cover chamber. After pressure has been released from the valve, use care to remove the controls and tubing. Note and sketch position of tubing and controls for re-assembly. The schematic in front of the Technical Manual can be used as a guide when reassembling pilot system.
3. Remove cover nuts and remove cover. If the valve has been in service for any length of time, chances are the cover will have to be loosened by driving upward along the edge of the cover with a **dull** cold chisel.



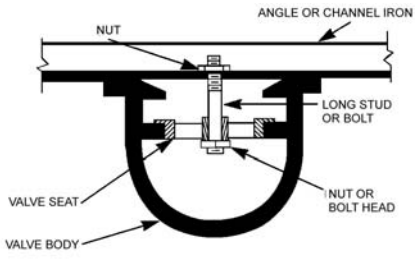
On 6” and smaller valves block and tackle or a power hoist can be used to lift valve cover by inserting proper size eye bolt in place of the center cover plug. On 8” and larger valves there are 4 holes (5/8” - 11 size) where jacking screws and/or eye bolts may be inserted for lifting purposes. **Pull cover straight up** to keep from damaging the integral seat bearing and stem.

COVER CENTER PLUG SIZE		
Valve size		Thread Size (NPT)
NGE	GE / AE	
DN 50	DN 32 - 40	1/4"
DN 65 - 100	DN 50 - 80	1/2"
DN 125 - 200	DN 100 - 150	3/4"
DN 250 - 300	DN 200 - 250	1"
DN 650 - 400	DN 300	1 1/4"
-	DN 350	1 1/2"
DN 500 - 600	DN 400	2"
TYTAN-S	DN 600 - 800	1"
TYTAN-M	DN 900 - 1000	2"
TYTAN-L	DN 900 - 1200	2"

4. Remove the diaphragm and disc assembly from the valve body. With smaller valves this can be accomplished by hand by **pulling straight up on the stem so as not to damage the seat bearing.** On large valves, an eye bolt of proper size can be installed in the stem and the diaphragm assembly can be then lifted with a block and tackle or power hoist. Take care not to damage the stem or bearings. The valve won't work if these are damaged.

VALVE STEM THREAD SIZE		
Valve size		Thread Size (Internal)
NGE	GE / AE	
DN 50 - 80	DN 32 - 65	10 - 32 UNF
DN 100 - 150	DN 80 - 100	1/4 - 28 UNF
DN 200 - 400	DN 150 - 350	3/8 - 24 UNF
DN 500 - 600	DN 400	1/2 - 20 UNF
TYTAN-S	DN 600 - 800	1/2 - 20 UNF
TYTAN-M	DN 900 - 1000	M20
TYTAN-L	DN 900 - 1200	M20

5. The next item to remove is the stem nut. Examine the stem threads above the nut for signs of mineral deposits or corrosion. If the threads are not clean, use a wire brush to remove as much of the residue as possible. Attach a good fitting wrench to the nut and give it a sharp “rap” rather than a steady pull. Usually several blows are sufficient to loosen the nut for further removal. On the smaller valves, the entire diaphragm assembly can be held by the stem in a vise **equipped with soft brass jaws** before removing the stem nut.
   The use of a pipe wrench or a vise without soft brass jaws scars the fine finish on the stem. No amount of careful dressing can restore the stem to its original condition. Damage to the finish of the stem can cause the stem to bind in the bearings and the valve will not open or close.
6. After the stem nut has been removed, the diaphragm assembly breaks down into its component parts. Removal of the disc from the disc retainer can be a problem if the valve has been in service for a long time. Using two screwdrivers inserted along the outside edge of the disc usually will accomplish its removal. Care should be taken to preserve the spacer washers in water, particularly if no new ones are available for re-assembly.
7. The only part left in the valve body is the seat which ordinarily does not require removal. Careful cleaning and polishing of inside and outside surfaces with 400 wet/dry sandpaper will usually restore the seat’s sharp edge. If, however, it is badly worn and replacement is necessary, it can be easily removed.
   Seats in valve sizes 1 1/4” through 6” are threaded into the valve body. They can be removed with accessory X109 Seat Removing Tool available from the factory. On 8” and larger valves, the seat is held in place by flat head machine screws. Use a tight-fitting, long shank screwdriver to prevent damage to seat screws. If upon removal of the screws the seat cannot be lifted out, it will be necessary to use a piece of angle or channel iron with a hole drilled in the center. Place it across the body so a long stud can be inserted through the center hole in the seat and the hole in the angle iron. By tightening the nut a uniform upward force is exerted on the seat for removal.
   Note: Do not lift up on the end of the angle iron as this may force the integral bearing out of alignment, causing the stem to bind.



INSPECTION OF PARTS

After the valve has been disassembled, each part should be examined carefully for signs of wear, corrosion, or any other abnormal condition. Usually, it is a good idea to replace the rubber parts (diaphragm and disc) unless they are free of signs of wear. These are available in a repair kit. Any other parts which appear doubtful should be replaced. WHEN ORDERING PARTS, BE SURE TO GIVE COMPLETE NAMEPLATE DATA, ITEM NUMBER AND DESCRIPTION.

Note: If a new disc isn't available, the existing disc can be turned over, exposing the unused surface for contact with the seat. The disc should be replaced as soon as practical.

REASSEMBLY

1. Reassembly is the reverse of the disassembly procedure. If a new disc has been installed, it may require a different number of spacer washers to obtain the right amount of "grip" on the disc. When the diaphragm assembly has been tightened to a point where the diaphragm cannot be twisted, the disc should be compressed very slightly by the disc guide. Excessive compression should be avoided. Use just enough spacer washers to hold the disc firmly without noticeable compression.
2. **MAKE SURE THE STEM NUT IS VERY TIGHT.** Attach a good fitting wrench to the nut and give it a sharp "rap" rather than a steady pull. Usually several blows are sufficient to tighten the stem nut for final tightening. Failure to do so could allow the diaphragm to pull loose and tear when subjected to pressure.
3. Carefully install the diaphragm assembly by lowering the stem through the seat bearing. Take care not to damage the stem or bearing. Line up the diaphragm holes with the stud or bolt holes on the body. On larger valves with studs, it may be necessary to hold the diaphragm assembly up part way while putting the diaphragm over the studs.
4. Put spring in place and replace cover. Make sure diaphragm is lying smooth under the cover.
5. Tighten cover nuts firmly using a cross-over pattern until all nuts are tight.
6. Test HYTROL Valve before re-installing pilot valve system.

TEST PROCEDURE AFTER VALVE ASSEMBLY

There are a few simple tests which can be made in the field to make sure the HYTROL Valve has been assembled properly. Do these before installing pilot system and returning valve to service. These are similar to the three troubleshooting tests.

1- Check the diaphragm assembly for freedom of movement after all pressure is removed from the valve. **SEE CAUTION!.** Insert fabricated tool into threaded hole in top of valve stem, and lift the diaphragm assembly manually. Note any roughness, sticking or grabbing. The diaphragm assembly should move smoothly throughout entire valve stroke. The tool is fabricated from rod that is threaded on one end to fit valve stem (See chart in Step 4 of "Disassembly" section.) and has a "T" Bar handle of some kind on the other end for easy gripping.

   Place marks on this diaphragm assembly lifting tool when the valve is closed and when manually positioned open. The distance between the two marks should be approximately the stem travel shown in stem travel chart. (See "Freedom of Movement Check" section.) If the stroke is different than that shown, there is a good reason to believe something is mechanically restricting the stroke of the valve. The cover must be removed, the obstruction located and removed. (See "Maintenance" Section for procedure.) Due to the weight of the diaphragm assembly this procedure is not possible on valves 8" and larger. on these valves, the same determination can be made by carefully introducing a low pressure-less than five psi) into the valve body with the cover vented. **SEE CAUTION!**. Looking in cover center hole see the diaphragm assembly lift easily without hesitation, and then settle back easily when the pressure is removed.

2- To check the valve for drip-tight closure, a line should be connected from the inlet to the cover, and pressure applied at the inlet of the valve. If properly assembled, the valve should hold tight with as low as ten PSI at the inlet. See "Tight Sealing Check" section.)

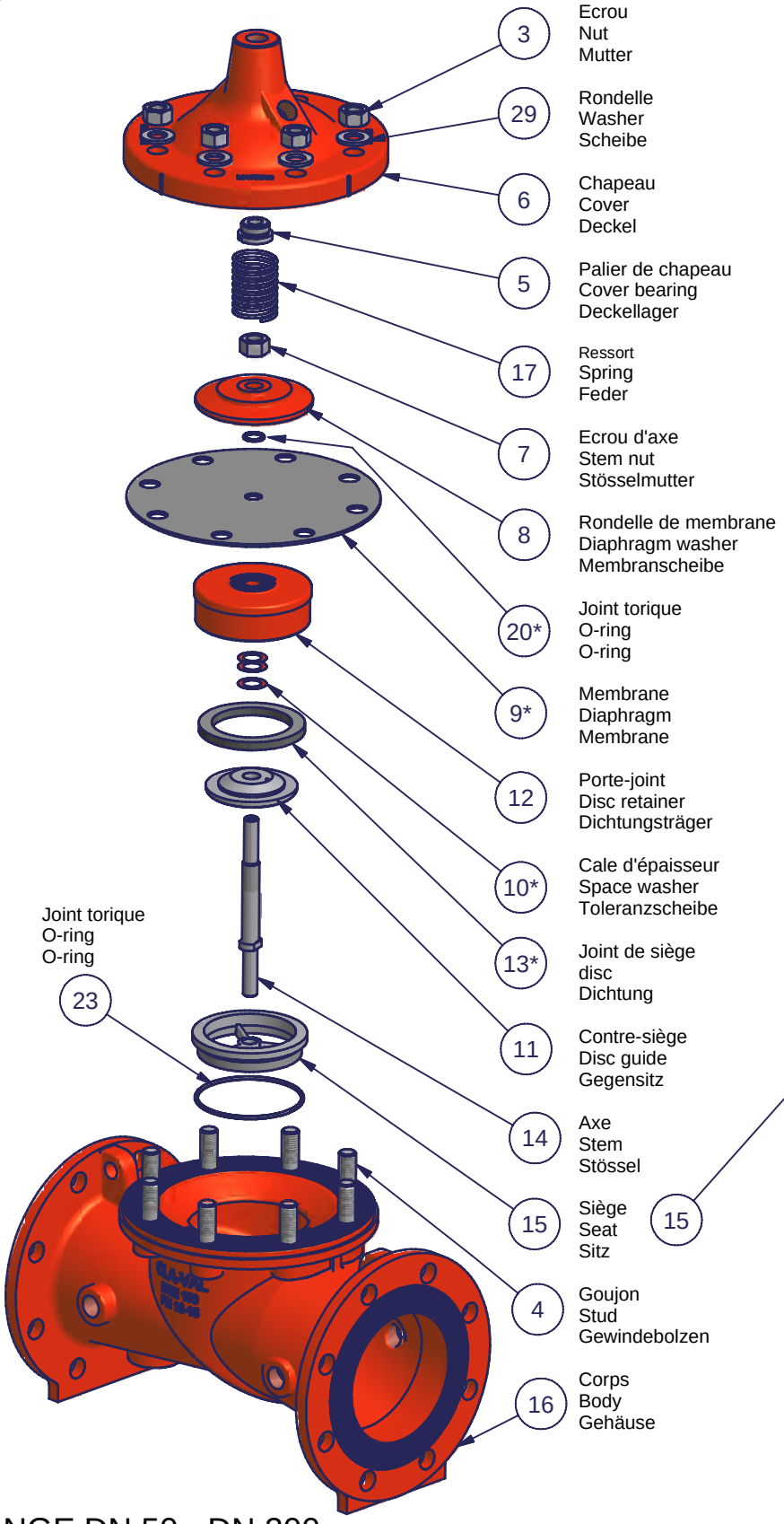
3- With the line connected from the inlet to the cover, apply full working pressure to the inlet. Check all around the cover for any leaks. Re-tighten cover nuts if necessary to stop leaks past the diaphragm.

4- Remove pressure, then re-install the pilot system and tubing exactly as it was prior to removal. **Bleed air from all high points.**

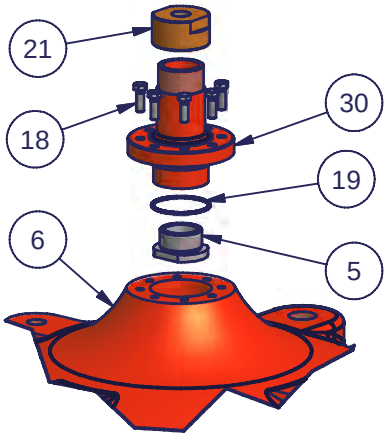
5- Follow steps under "Start-Up and Adjustment" Section in Technical Manual for returning complete valve back to service.

CLA-VAL **100-01 NGE**

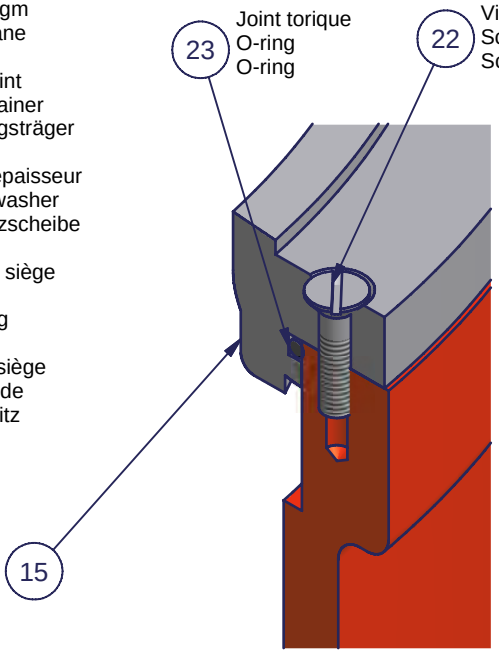
Vanne de base - Main Valve - Hauptventil



NGE DN 50 - DN 200



NGE DN 500 - DN 600



NGE DN 250 - DN 600

* = CLA-KIT

CLA-VAL **100-01/KN NGE**

DN 65
PN 10 - 16 - 25

STD: STANDARD

PIECE DE RECHANGE / SPARE PARTS / ERSATZTEILE

KIT DE REPARATION / REPAIR KIT / REPARATURSATZ		
(a)	CLA-KIT HYTROL100-01 - GE 50/PN 10 - 16	**91698-05**
(b)	CLA-KIT HYTROL100-01 - GE 50/PN 25	☎ **CLA-VAL**

POS.	DESCRIPTION	DESCRIPTION	BESCHREIBUNG	MAT.	CLA-VAL Nr.
1	Bouchon-purgeur	Air release plug	Entlüftungstopfen	303	57576
2	Bouchon	Cover plug	Stopfen	316	BGT2001
3	Ecrou	Stud nut	Mutter	303	67801-08E
4	Goujon	Stud	Gewindebolzen	303	57621-02
5	Palier de chapeau HC	Cover bearing HC	Deckellager HK	303	58409
6	Chapeau	Cover	Deckel	FD4	57186-40
7	Ecrou d'axe	Stem nut	Stösselmutter	303	89376-01G
8	Rondelle de membrane	Diaphragm washer	Membranscheibe	PLA	2665501K
9	Membrane	Diaphragm	Membrane	RBR	*80522G (a)*
9.1	Membrane (PN25)	Diaphragm (PN25)	Membrane (PN25)	RBR	*C-1493-01 (b)*
10	Cale d'épaisseur	Space washer	Toleranzscheibe	FIB	*V-5232D (a/b)*
11	Contre-siège	Disc guide	Gegensitz	316	32560F
12	Porte-joint	Disc retainer	Dichtungsträger	303	57383-01
13	Joint de siège	Disc	Dichtung	RBR	*V-5564K (a/b)*
13.1	Joint de siège (***)	Disc (***)	Dichtung (***)	PET	*21265-01C (b***)*
14	Axe	Stem	Stössel	303	57287
15	Siège	Seat	Sitz	316	C-4135-01C
16	Corps	Body	Gehäuse	FD4	(**)
17	Ressort	Spring	Feder	302	C-3147A
17.1	Ressort renforcé (PN25)	Spring heavy (PN25)	Verstärkte Feder (PN25)	316	C-3152A
20	Joint torique	O-ring	O-Ring	RBR	*00714G (a/b)*
23	Joint torique	O-ring	O-Ring	RBR	00775H
25	Bouchon	Plug	Stopfen	316	BGT2001
29	Rondelle plate	Washer	Unterlegscheibe	303	67748-04G

(**) Voir / See / Siehe HYT016F
(***) Recommandé si ΔP>16 bar / Recommended if ΔP>16 bar / Empfohlen wenn ΔP>16 bar

KC: Revêtement époxy / Standard epoxy coating / Epoxy-Pulverbeschichtung (minimum 250 µm)
KCO: KC + Visserie en acier inoxydable / Stainless steel bolts / Deckelschrauben aus Edelstahl
KCS: KC + Siège et contre-siège en acier inoxydable / Stainless steel seat and guide / Sitz und Gegensitz aus Edelstahl
KCOS: KCO + KCS.

CLA-VAL **100-01/KN NGE**

DN 80
PN 10 - 16 - 25

STD: STANDARD

PIECE DE RECHANGE / SPARE PARTS / ERSATZTEILE

KIT DE REPARATION / REPAIR KIT / REPARATURSATZ		
(a)	CLA-KIT HYTROL100-01 - GE 50/PN 10 - 16	**91698-05**
(b)	CLA-KIT HYTROL100-01 - GE 50/PN 25	☎ **CLA-VAL**

POS.	DESCRIPTION	DESCRIPTION	BESCHREIBUNG	MAT.	CLA-VAL Nr.
1	Bouchon-purgeur	Air release plug	Entlüftungstopfen	303	57576
2	Bouchon	Cover plug	Stopfen	316	BGT2001
3	Ecrou	Stud nut	Mutter	303	67801-08E
4	Goujon	Stud	Gewindebolzen	303	57621-02
5	Palier de chapeau HC	Cover bearing HC	Deckellager HK	303	58409
6	Chapeau	Cover	Deckel	FD4	57186-40
7	Ecrou d'axe	Stem nut	Stösselmutter	303	89376-01G
8	Rondelle de membrane	Diaphragm washer	Membranscheibe	PLA	2665501K
9	Membrane	Diaphragm	Membrane	RBR	*80522G (a)*
9.1	Membrane (PN25)	Diaphragm (PN25)	Membrane (PN25)	RBR	*C-1493-01 (b)*
10	Cale d'épaisseur	Space washer	Toleranzscheibe	FIB	*V-5232D (a/b)*
11	Contre-siège	Disc guide	Gegensitz	316	32560F
12	Porte-joint	Disc retainer	Dichtungsträger	303	57383-01
13	Joint de siège	Disc	Dichtung	RBR	*V-5564K (a/b)*
13.1	Joint de siège (***)	Disc (***)	Dichtung (***)	PET	*21265-01C (b***)*
14	Axe	Stem	Stössel	303	57287
15	Siège	Seat	Sitz	316	C-4135-01C
16	Corps	Body	Gehäuse	FD4	(**)
17	Ressort	Spring	Feder	302	C-3147A
17.1	Ressort renforcé (PN25)	Spring heavy (PN25)	Verstärkte Feder (PN25)	316	C-3152A
20	Joint torique	O-ring	O-Ring	RBR	*00714G (a/b)*
23	Joint torique	O-ring	O-Ring	RBR	00775H
25	Bouchon	Plug	Stopfen	316	BGT2001
29	Rondelle plate	Washer	Unterlegscheibe	303	67748-04G

(**) Voir / See / Siehe HYT016F
(***) Recommandé si ΔP>16 bar / Recommended if ΔP>16 bar / Empfohlen wenn ΔP>16 bar

KC: Revêtement époxy / Standard epoxy coating / Epoxy-Pulverbeschichtung (minimum 250 µm)
KCO: KC + Visserie en acier inoxydable / Stainless steel bolts / Deckelschrauben aus Edelstahl
KCS: KC + Siège et contre-siège en acier inoxydable / Stainless steel seat and guide / Sitz und Gegensitz aus Edelstahl
KCOS: KCO + KCS.

CLA-VAL **100-01/KN NGE**

DN 100
PN 10 - 16 - 25

STD: STANDARD

PIECE DE RECHANGE / SPARE PARTS / ERSATZTEILE

KIT DE REPARATION / REPAIR KIT / REPARATURSATZ		
(a)	CLA-KIT HYTROL100-01 - GE 80/PN 10 - 16	**91698-12**
(b)	CLA-KIT HYTROL100-01 - GE 80/PN 25	☎ **CLA-VAL**

POS.	DESCRIPTION	DESCRIPTION	BESCHREIBUNG	MAT.	CLA-VAL Nr.
1	Bouchon-purgeur	Air release plug	Entlüftungstopfen	303	57576-02
2	Bouchon	Cover plug	Stopfen	316	BGT3001
3	Ecrou	Stud nut	Mutter	303	67805-08F
4	Goujon	Stud	Gewindebolzen	303	57621-04
5	Palier de chapeau HC	Cover bearing HC	Deckellager HK	303	57312-01
6	Chapeau	Cover	Deckel	FD4	57188-40
7	Ecrou d'axe	Stem nut	Stösselmutter	303	89377-01E
8	Rondelle de membrane	Diaphragm washer	Membranscheibe	FTG	V-5447/KC
9	Membrane	Diaphragm	Membrane	RBR	*83241A* *(a)*
9.1	Membrane (PN25)	Diaphragm (PN25)	Membrane (PN25)	RBR	*C-8262C* *(b)*
10	Cale d'épaisseur	Space washer	Toleranzscheibe	FIB	*V-0631B* *(a/b)*
11	Contre-siège	Disc guide	Gegensitz	316	C-7389E
12	Porte-joint	Disc retainer	Dichtungsträger	FTG	V-5449/KC
13	Joint de siège	Disc	Dichtung	RBR	*V-1734C* *(a/b)*
13.1	Joint de siège (***)	Disc (***)	Dichtung (***)	PET	*21267-01J* *(b***)*
14	Axe	Stem	Stössel	303	57289
15	Siège	Seat	Sitz	316	C-7391A
16	Corps	Body	Gehäuse	FD4	(**)
17	Ressort	Spring	Feder	302	C-3149G
17.1	Ressort renforcé (PN25)	Spring heavy (PN25)	Verstärkte Feder (PN25)	316	C-1106J
20	Joint torique	O-ring	O-Ring	RBR	*00750A* *(a/b)*
23	Joint torique	O-ring	O-Ring	RBR	00788A
25	Bouchon	Plug	Stopfen	316	BGT3001
29	Rondelle plate	Washer	Unterlegscheibe	303	67750-04C

(**) Voir / See / Siehe HYT016F
(***) Recommandé si ΔP>16 bar / Recommended if ΔP>16 bar / Empfohlen wenn ΔP>16 bar

KC: Revêtement époxy / Standard epoxy coating / Epoxy-Pulverbeschichtung (minimum 250 µm)
KCO: KC + Visserie en acier inoxydable / Stainless steel bolts / Deckelschrauben aus Edelstahl
KCS: KC + Siège et contre-siège en acier inoxydable / Stainless steel seat and guide / Sitz und Gegensitz aus Edelstahl
KCOS: KCO + KCS.

CLA-VAL **100-01/KN NGE**

DN 125
PN 10 - 16 - 25

STD: STANDARD

PIECE DE RECHANGE / SPARE PARTS / ERSATZTEILE

KIT DE REPARATION / REPAIR KIT / REPARATURSATZ		
(a)	CLA-KIT HYTROL100-01 - GE 100/PN 10 - 16	**91698-13**
(b)	CLA-KIT HYTROL100-01 - GE 100/PN 25	☎ **CLA-VAL**

POS.	DESCRIPTION	DESCRIPTION	BESCHREIBUNG	MAT.	CLA-VAL Nr.
1	Bouchon-purgeur	Air release plug	Entlüftungstopfen	303	57576-02
2	Bouchon	Cover plug	Stopfen	316	BGT4001
3	Ecrou	Stud nut	Mutter	303	67811-08D
4	Goujon	Stud	Gewindebolzen	303	37048-02C
5	Palier de chapeau HC	Cover bearing HC	Deckellager HK	303	58596
6	Chapeau	Cover	Deckel	FD4	57189-40
7	Ecrou d'axe	Stem nut	Stösselmutter	303	89378-01C
8	Rondelle de membrane	Diaphragm washer	Membranscheibe	FTG	V-5420/KC
9	Membrane	Diaphragm	Membrane	RBR	*86807F (a)*
9.1	Membrane (PN25)	Diaphragm (PN25)	Membrane (PN25)	RBR	*C-8184J (b)*
10	Cale d'épaisseur	Space washer	Toleranzscheibe	FIB	*V-0634F (a/b)*
11	Contre-siège	Disc guide	Gegensitz	316	31052E
12	Porte-joint	Disc retainer	Dichtungsträger	FTG	V-5457/KC
13	Joint de siège	Disc	Dichtung	RBR	*V-5467F (a/b)*
13.1	Joint de siège (***)	Disc (***)	Dichtung (***)	PET	*21268-01G (b***)*
14	Axe	Stem	Stössel	303	57290
15	Siège	Seat	Sitz	316	31053C
16	Corps	Body	Gehäuse	FD4	(**)
17	Ressort	Spring	Feder	302	C-1533D
17.1	Ressort renforcé (PN25)	Spring heavy (PN25)	Verstärkte Feder (PN25)	302	C-1408J
20	Joint torique	O-ring	O-Ring	RBR	*00752G (a/b)*
23	Joint torique	O-ring	O-Ring	RBR	00836H
25	Bouchon	Plug	Stopfen	316	BGT4001
29	Rondelle plate	Washer	Unterlegscheibe	303	67753-04G

(**) Voir / See / Siehe HYT016F
(***) Recommandé si ΔP>16 bar / Recommended if ΔP>16 bar / Empfohlen wenn ΔP>16 bar

KC: Revêtement époxy / Standard epoxy coating / Epoxy-Pulverbeschichtung (minimum 250 µm)
KCO: KC + Visserie en acier inoxydable / Stainless steel bolts / Deckelschrauben aus Edelstahl
KCS: KC + Siège et contre-siège en acier inoxydable / Stainless steel seat and guide / Sitz und Gegensitz aus Edelstahl
KCOS: KCO + KCS.

CLA-VAL **100-01/KN NGE**

DN 150
PN 10 - 16 - 25

STD: STANDARD

PIECE DE RECHANGE / SPARE PARTS / ERSATZTEILE

KIT DE REPARATION / REPAIR KIT / REPARATURSATZ		
(a)	CLA-KIT HYTROL100-01 - GE 100/PN 10 - 16	**91698-13**
(b)	CLA-KIT HYTROL100-01 - GE 100/PN 25	☎ **CLA-VAL**

POS.	DESCRIPTION	DESCRIPTION	BESCHREIBUNG	MAT.	CLA-VAL Nr.
1	Bouchon-purgeur	Air release plug	Entlüftungstopfen	303	57576-02
2	Bouchon	Cover plug	Stopfen	316	BGT4001
3	Ecrou	Stud nut	Mutter	303	67811-08D
4	Goujon	Stud	Gewindebolzen	303	37048-02C
5	Palier de chapeau HC	Cover bearing HC	Deckellager HK	303	58596
6	Chapeau	Cover	Deckel	FD4	57189-40
7	Ecrou d'axe	Stem nut	Stösselmutter	303	89378-01C
8	Rondelle de membrane	Diaphragm washer	Membranscheibe	FTG	V-5420/KC
9	Membrane	Diaphragm	Membrane	RBR	*86807F (a)*
9.1	Membrane (PN25)	Diaphragm (PN25)	Membrane (PN25)	RBR	*C-8184J (b)*
10	Cale d'épaisseur	Space washer	Toleranzscheibe	FIB	*V-0634F (a/b)*
11	Contre-siège	Disc guide	Gegensitz	316	31052E
12	Porte-joint	Disc retainer	Dichtungsträger	FTG	V-5457/KC
13	Joint de siège	Disc	Dichtung	RBR	*V-5467F (a/b)*
13.1	Joint de siège (***)	Disc (***)	Dichtung (***)	PET	*21268-01G (b***)*
14	Axe	Stem	Stössel	303	57290
15	Siège	Seat	Sitz	316	31053C
16	Corps	Body	Gehäuse	FD4	(**)
17	Ressort	Spring	Feder	302	C-1533D
17.1	Ressort renforcé (PN25)	Spring heavy (PN25)	Verstärkte Feder (PN25)	302	C-1408J
20	Joint torique	O-ring	O-Ring	RBR	*00752G (a/b)*
23	Joint torique	O-ring	O-Ring	RBR	00836H
25	Bouchon	Plug	Stopfen	316	BGT4001
29	Rondelle plate	Washer	Unterlegscheibe	303	67753-04G

(**) Voir / See / Siehe HYT016F
(***) Recommandé si ΔP>16 bar / Recommended if ΔP>16 bar / Empfohlen wenn ΔP>16 bar

KC: Revêtement époxy / Standard epoxy coating / Epoxy-Pulverbeschichtung (minimum 250 µm)
KCO: KC + Visserie en acier inoxydable / Stainless steel bolts / Deckelschrauben aus Edelstahl
KCS: KC + Siège et contre-siège en acier inoxydable / Stainless steel seat and guide / Sitz und Gegensitz aus Edelstahl
KCOS: KCO + KCS.

CLA-VAL **100-01/KN NGE**

DN 200
PN 10 - 16 - 25

STD: STANDARD

PIECE DE RECHANGE / SPARE PARTS / ERSATZTEILE

KIT DE REPARATION / REPAIR KIT / REPARATURSATZ		
(a)	CLA-KIT HYTROL100-01 - GE 150/PN 10 - 16	**91698-15**
(b)	CLA-KIT HYTROL100-01 - GE 150/PN 25	☎ **CLA-VAL**

POS.	DESCRIPTION	DESCRIPTION	BESCHREIBUNG	MAT.	CLA-VAL Nr.
1	Bouchon-purgeur	Air release plug	Entlüftungstopfen	303	57576-02
2	Bouchon	Cover plug	Stopfen	316	BGT4001
3	Ecrou	Stud nut	Mutter	303	67811-08D
4	Goujon	Stud	Gewindebolzen	303	37048-02C
5	Palier de chapeau HC	Cover bearing HC	Deckellager HK	303	58582
6	Chapeau	Cover	Deckel	FD4	57190-40
7	Ecrou d'axe	Stem nut	Stösselmutter	303	89379-01A
8	Rondelle de membrane	Diaphragm washer	Membranscheibe	FTG	V-5521/KC
9	Membrane	Diaphragm	Membrane	RBR	*87893E (a)*
9.1	Membrane (PN25)	Diaphragm (PN25)	Membrane (PN25)	RBR	*C-6365F (b)*
10	Cale d'épaisseur	Space washer	Toleranzscheibe	FIB	*V-5138C (a/b)*
11	Contre-siège	Disc guide	Gegensitz	316	C-7148E
12	Porte-joint	Disc retainer	Dichtungsträger	FTG	V-1672/KC
13	Joint de siège	Disc	Dichtung	RBR	*V-1692C (a/b)*
13.1	Joint de siège (***)	Disc (***)	Dichtung (***)	PET	*21269-01E (b***)*
14	Axe	Stem	Stössel	303	57291
15	Siège	Seat	Sitz	316	C-7150A
16	Corps	Body	Gehäuse	FD4	(**)
17	Ressort	Spring	Feder	302	C-1534B
17.1	Ressort renforcé (PN25)	Spring heavy (PN25)	Verstärkte Feder (PN25)	316	C-1409G
20	Joint torique	O-ring	O-Ring	RBR	*00941F (a/b)*
23	Joint torique	O-ring	O-Ring	RBR	00851G
25	Bouchon	Plug	Stopfen	316	BGT4001
29	Rondelle plate	Washer	Unterlegscheibe	303	67753-04G

(**) Voir / See / Siehe HYT016F
(***) Recommandé si ΔP>16 bar / Recommended if ΔP>16 bar / Empfohlen wenn ΔP>16 bar

KC: Revêtement époxy / Standard epoxy coating / Epoxy-Pulverbeschichtung (minimum 250 µm)
KCO: KC + Visserie en acier inoxydable / Stainless steel bolts / Deckelschrauben aus Edelstahl
KCS: KC + Siège et contre-siège en acier inoxydable / Stainless steel seat and guide / Sitz und Gegensitz aus Edelstahl
KCOS: KCO + KCS.

CLA-VAL **100-01/KN NGE**

DN 250
PN 10 - 16 - 25

STD: STANDARD

PIECE DE RECHANGE / SPARE PARTS / ERSATZTEILE

KIT DE REPARATION / REPAIR KIT / REPARATURSATZ		
(a)	CLA-KIT HYTROL100-01 - GE 200/PN 10 - 16	**91698-30**
(b)	CLA-KIT HYTROL100-01 - GE 200/PN 25	☎ **CLA-VAL**

POS.	DESCRIPTION	DESCRIPTION	BESCHREIBUNG	MAT.	CLA-VAL Nr.
1	Bouchon-purgeur	Air release plug	Entlüftungstopfen	303	57576-02
2	Bouchon	Cover plug	Stopfen	316	BGT6001
3	Ecrou	Stud nut	Mutter	303	67811-08D
4	Goujon	Stud	Gewindebolzen	303	37048-02C
5	Palier de chapeau HC	Cover bearing HC	Deckellager HK	303	58583
6	Chapeau	Cover	Deckel	FD4	57191-40
7	Ecrou d'axe	Stem nut	Stösselmutter	303	89380-01J
8	Rondelle de membrane	Diaphragm washer	Membranscheibe	FTG	V-1354/KC
9	Membrane	Diaphragm	Membrane	RBR	*V-5125K (a)*
9.1	Membrane (PN 25)	Diaphragm (PN 25)	Membrane (PN 25)	RBR	*V-5571E (b)*
10	Cale d'épaisseur	Space washer	Toleranzscheibe	FIB	*V-5133D (a/b)*
11	Contre-siège	Disc guide	Gegensitz	316	46698H
12	Porte-joint	Disc retainer	Dichtungsträger	FTG	V-1356/KC
13	Joint de siège	Disc	Dichtung	RBR	*V-5566E (a/b)*
13.1	Joint de siège (***)	Disc (***)	Dichtung (***)	PET	*21270-01C (b***)*
14	Axe	Stem	Stössel	303	V-1353B
15	Siège	Seat	Sitz	316	46699F
16	Corps	Body	Gehäuse	FD4	(**)
17	Ressort	Spring	Feder	302	C-7948H
20	Joint torique	O-ring	O-Ring	RBR	*00758D (a/b)*
22	Vis (8x)	Screw (8x)	Schraube (8x)	303	67972-25H
23	Joint torique	O-ring	O-Ring	RBR	00982K
25	Bouchon	Plug	Stopfen	316	BGT6001
29	Rondelle plate	Washer	Unterlegscheibe	303	67753-04G

(**) Voir / See / Siehe HYT016F
(***) Recommandé si ΔP>16 bar / Recommended if ΔP>16 bar / Empfohlen wenn ΔP>16 bar

KC: Revêtement époxy / Standard epoxy coating / Epoxy-Pulverbeschichtung (minimum 250 µm)
KCO: KC + Visserie en acier inoxydable / Stainless steel bolts / Deckelschrauben aus Edelstahl
KCS: KC + Siège et contre-siège en acier inoxydable / Stainless steel seat and guide / Sitz und Gegensitz aus Edelstahl
KCOS: KCO + KCS.

CLA-VAL **100-01/KN NGE**

DN 300
PN 10 - 16 - 25

STD: STANDARD

PIECE DE RECHANGE / SPARE PARTS / ERSATZTEILE

KIT DE REPARATION / REPAIR KIT / REPARATURSATZ		
(a)	CLA-KIT HYTROL100-01 - GE 250/PN 10 - 16	**91698-31**
(b)	CLA-KIT HYTROL100-01 - GE 250/PN 25	☎ **CLA-VAL**

POS.	DESCRIPTION	DESCRIPTION	BESCHREIBUNG	MAT.	CLA-VAL Nr.
1	Bouchon-purgeur	Air release plug	Entlüftungstopfen	303	57576-02
2	Bouchon	Cover plug	Stopfen	316	BGT6001
3	Ecrou	Stud nut	Mutter	SST	67814-08H
4	Goujon	Stud	Gewindebolzen	303	57621-08
5	Palier de chapeau HC	Cover bearing HC	Deckellager HK	303	58584
6	Chapeau	Cover	Deckel	FD4	57192-40
7	Ecrou d'axe	Stem nut	Stösselmutter	303	25925-01H
8	Rondelle de membrane	Diaphragm washer	Membranscheibe	FTG	V-1778/KC
9	Membrane	Diaphragm	Membrane	RBR	*V-5576D (a)*
9.1	Membrane (PN 25)	Diaphragm (PN 25)	Membrane (PN 25)	RBR	*1650301D (b)*
10	Cale d'épaisseur	Space washer	Toleranzscheibe	FIB	*V-5160G (a/b)*
11	Contre-siège	Disc guide	Gegensitz	316	C-7957-01G
12	Porte-joint	Disc retainer	Dichtungsträger	FTG	V-1774/KC
13	Joint de siège	Disc	Dichtung	NBR	*V-5569J (a/b)*
13.1	Joint de siège (***)	Disc (***)	Dichtung (***)	PET	*21271-01A (b***)*
14	Axe	Stem	Stössel	303	V-1789G
15	Siège	Seat	Sitz	316	C-7958-01E
16	Corps	Body	Gehäuse	FD4	(*)
17	Ressort	Spring	Feder	SST	C-9113G
20	Joint torique	O-ring	O-Ring	RBR	*00760K (a/b)*
22	Vis (10x)	Screw (10x)	Schraube (10x)	303	67972-25H
23	Joint torique	O-ring	O-Ring	RBR	00865G
25	Bouchon	Plug	Stopfen	316	BGT6001
29	Rondelle plate	Washer	Unterlegscheibe	304	67754-04

(**) Voir / See / Siehe HYT016F
(***) Recommandé si ΔP>16 bar / Recommended if ΔP>16 bar / Empfohlen wenn ΔP>16 bar

KC: Revêtement époxy / Standard epoxy coating / Epoxy-Pulverbeschichtung (minimum 250 µm)
KCO: KC + Visserie en acier inoxydable / Stainless steel bolts / Deckelschrauben aus Edelstahl
KCS: KC + Siège et contre-siège en acier inoxydable / Stainless steel seat and guide / Sitz und Gegensitz aus Edelstahl
KCOS: KCO + KCS.

CLA-VAL **311C/D**

Standard Solenoid Valve 3/2 Lucifer

GENERAL APPLICATION VALVES 3/2 - DIRECT OPERATED

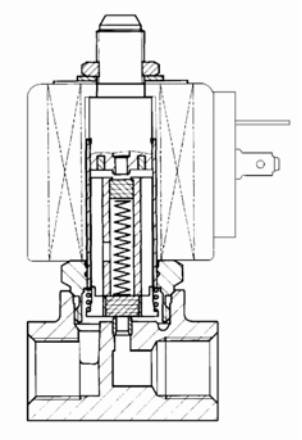


Fig. 1

Solenoid valves are electro-mechanical devices that control fluid flow. This is achieved by opening or closing one or several orifices in the solenoid valve. The (solenoid) coil is the electrical element that converts an electrical signal into a mechanical force which, in turn, shifts the mobile plunger that opens or closes an orifice (nozzle) by means of its seat disc(s). Solenoid valves are usually constructed from 3 distinct components:

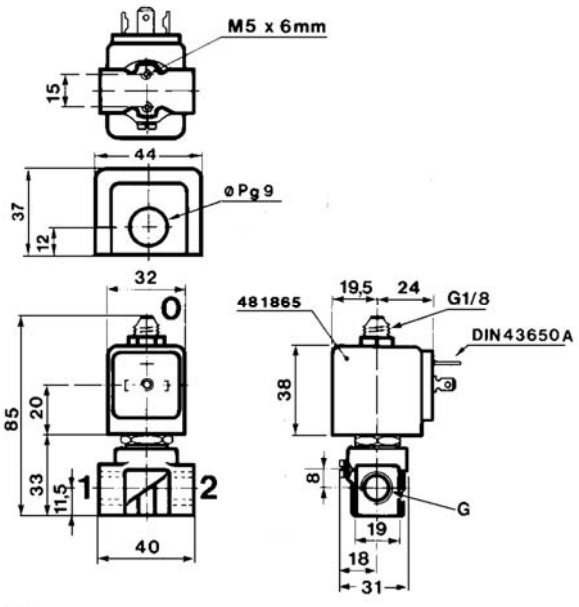
- The body (including the sleeve assembly)
- The coil (or coil housing)
- The housing (or nut/nameplate fixing elements).

These 3 modular components are in many cases interchangeable i.e. a valve body can be used with a number of coil/housing combinations.

DIRECT OPERATED VALVES (SEE FIG. 1)

The magnetic force is used directly to open or close the passage of fluid at the plunger sealing. The performance is limited by the available performance of the coil (limits of pressure/orifice size.)The pressure rating of the valve starts from zero bar to the maximum value.

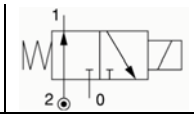
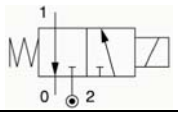
DIMENSIONS



CLA-VAL **311C/D**

Standard Solenoid Valve 3/2 Lucifer

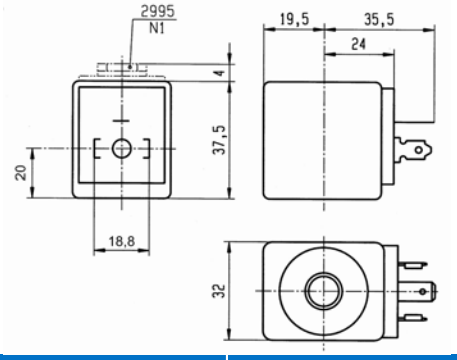
TECHNICAL DATA

Function:	3/2 Universal solenoid valve: closed or open when de-energized Open: De-energized  Closed: De-energized 
Valve design:	Direct operated poppet valve
Port size:	G 1/8
Mounting position:	Unrestricted
Material specifications:	Brass nickel plated body or stainless steel SS316. Internal parts from stainless steel
Manual override:	• The manual override allows to feign the switched on of the solenoid valve. • The manual override situated on the body of the solenoid valve is activated by a clockwise screw rotation (1/4 turn).
Safe body working pressure:	• dP min = 0 bar • dP max = 30 bar
Response time (for air):	• With DC supply: Switch on time 15 ms - Switch off time 10 ms • With AC supply: Switch on time 10 ms - Switch off time 10 ms
Cycling rate:	Up to 2000 cycles per minute
Media:	Dry or lubricated air, inert gases, neutral liquids, mineral and fuel oils up to 76 cSt (10°E) viscosity
Ambient temperature:	-10°C to + 50°C
Electrical parts:	Standard coil 2995/481865, 483510 encapsulated in synthetic material. Electrical connection with plug 2P + E, DIN 43650 type A. Degree of protection IP65.
Special protections:	Coil housings with degree of protection IP67, large choice of «explosion proof» electrical parts, available on request.
Voltages:	CC: 12/24/48/110V - CA/50Hz: 24/48/110/220-30
Class of insulation material:	Class F 155°C
Solenoid duty:	Continuous duty solenoid
Power rating:	8-14 W
Voltage tolerance:	-10% to +10% of nominal

SPECIFICATIONS FOR STANDARD COIL

This coil conforms to the IEC/CENELEC safety standards and complies with European low-voltage directive 73/23/EC.

Specifications	Degree of protection	Class of insulation	Electrical connection	Ambient temperature	Electrical power			
					DC		AC	
					Pn (hot)	**P** (cold) 20°C	**Pn** (holding)	Attraction cold
Standard	**IP65** according to IEC/EN 60529 standards (with plug connection)	F 155°CF	Trough a 2 P + E plug according to DIN 43650 type A	-40°C to +50°C-	9 W	12 W	8 W	26 VA / (9 W)



CLA-VAL **311C/D**

Standard Solenoid Valve 3/2 Lucifer

OPTION: EXPLOSION-PROOF SOLENOIDS II 2 G EEX DM IIC T4

Explosionproof solenoids with flameproof enclosure/encapsulation “dm”

According to ATEX directive 94/9/EC and Standards EN 50014, EN 50018, EN 50028 and EN 50281-1-1.

Application:

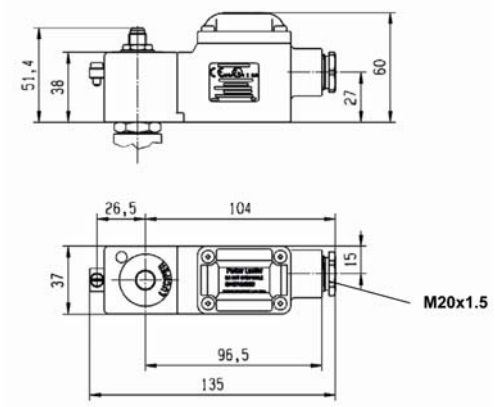
Control of solenoid valves intended for installations in hazardous areas in which explosive gas-atmospheres are present, i.e. zones 1 or zones 2 (ATEX: Group II, apparatus categories 2G or 3G).

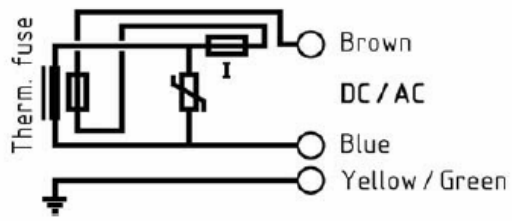
The enclosure of these explosion proofs solenoids "dm" is made entirely in synthetic material. All external metallic components in contact with the atmosphere are made in stainless steel. The integrated sealing and O-rings assure the degree of protection IP67. Therefore, these products took into account not only the suitability with hazardous areas but also extremely corrosive environment, e. g. Chemical, Petrochemical and Refineries industries (CPR). Due to the compact size and easy cable connection by screw terminals, these solenoids may be mounted in confined spaces.

Features:

The coil winding (copper wires of insulation Class H) and magnetic iron path are encapsulated in synthetic material Class H and meet "m" protection. The connection box and cover of selected high quality synthetic material (Class H) in order to meet the standard EN 50018 for type of protection "d" flameproof enclosure. **The cable gland assembly M20x1.5 makes part of the "d" certificated enclosure.** The solenoids are provided with an embedded non-resetting thermal fuse to prevent excessive heating, i.e. assuring the maximum allowed surface temperatures T5/T4. A varistor for peak voltages suppression is potted-in, in Epoxy resin Class H.

Reference:	495905				
Approval / Type of protection:	**LCIE 02 ATEX 6451 X** Gas II 2 G – EEx dm IIC T4				
Degree of protection:	IP67				
Ambiant temperature:	-40 to +65 °C				
Insulation Class:	H (180 °)				
Electrical connection:	Electric connection is done in the connection box on an easily accessible connector terminal. The introduction of the cable (Ø min 7mm, Ø max. 9mm, section max. 2.5mm²) in the connection box passes by the built in M20x1.5 cable gland.				
Electr. Power:	DC	**Pn** (hot)	8 W	**P** (cold) 20°C	9 W
	AC	**Pn** (holding)	8 W	Attraction cold	9 W
Nominal voltage:	6 to 110 VCC 12 to 240 VCA				
Voltage tolerance:	± 10 % of the nominal voltage				
Solenoid duty:	Continuous duty solenoid (ED 100%)				





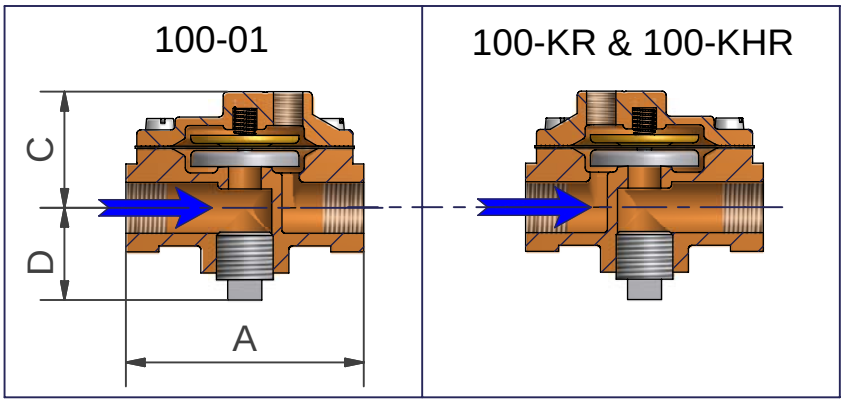
CLA-VAL **100-01 / 100-KR / 100-KHR**

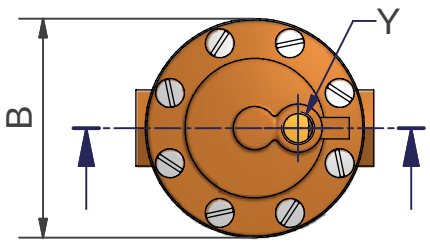
HYTROL 3/8" - 1/2" - 3/4" - 1"
PN 10 - 16 - 25

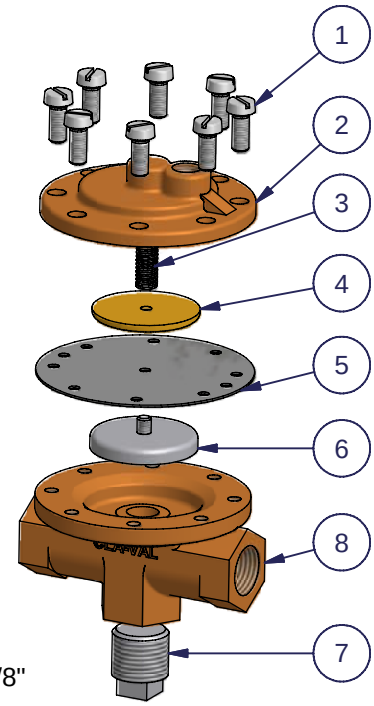
Vanne auxiliaire HYTROL 100-01 / 100-KR / 100-KHR

Auxiliary Valve HYTROL 100-01 / 100-KR / 100-KHR

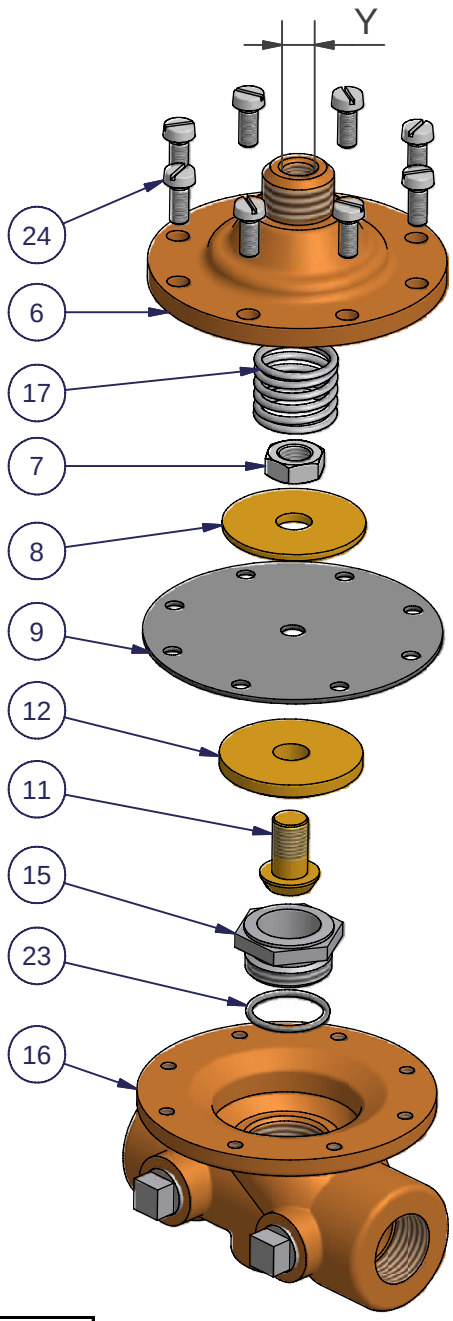
Hilfsventil HYTROL 100-01 / 100-KR / 100-KHR







HYTROL 3/8"



HYTROL 1/2" - 3/4" - 1"

	A	B	C	D	Y	Poids Weight Gew icht	Kv (m3/h)	Cv (l/s)
Rp 3/8"	70	64	38	32	1/8"	1 kg	1,5	0,43
Rp 1/2"	89	79	54	25	1/8"	1 kg	5,2	1,44
Rp 3/4"	89	79	54	25	1/8"	1 kg	7,3	2,04
Rp 1"	130	111	70	41	1/4"	3 kg	11,5	3,20

Kv ou Cv = m3/h ou l/s @ 100kPa (1bar) perte de charge pour une eau à 15° (vanne totalement ouverte)
The Kv or Cv = m3/h ou l/s @ 100 kPa (1 bar) head loss with 15° water (valve totally open)
Die Koeffizienten Kv und Cv sind definiert als Wasserdurchfluss, bei einem Druckaball im Ventil von 1 bar

CLA-VAL **100-01 / 100-KR / 100-KHR**

3/8"
PN 10 - 16 - 25

STD: Standard

PIECE DE RECHANGE / SPARE PARTS / ERSATZTEILE

KIT DE REPARATION / REPAIR KIT / REPARATURSATZ		
	-	-

POS.	DESCRIPTION	DESCRIPTION	BESCHREIBUNG	MAT.	CLA-VAL Nr.
1	Vis (8x)	Screw (8x)	Schrauben (8x)	SST	67578-21B
2	Chapeau	Cover	Deckel	BRZ	C-0090F
3	Ressort	Spring	Feder	316	67362E
*3.1	Ressort renforcé	Spring (heavy)	Verstärkte Feder	303	V-5044C
4	Rondelle de membrane	Diaphragm washer	Membranscheibe	LTO	V-1662F
5	Membrane	Diaphragm	Membrane	RBR	61877H
6	Porte-joint & joint	Disc retainer assembly	Dichtungsträger	303/RBR	30856K
7	Bouchon 3/8"	Plug 3/8"	Zapfen 3/8"	316	BGT1001
8	Corps 3/8"	Body 3/8"	Gehäuse 3/8"	BRZ	C-0091D

* (V-5044C) Pour 100-KHR uniquement / For 100-KHR only / Nur für 100-KHR

TYPE 100-01/STD	CLA-VAL Nr.
100-01 / 100-KR	100-01-203H
100-KHR	100-01-727F

CLA-VAL **100-01 / 100-KR / 100-KHR**

1/2" - 3/4"
PN 10 - 16 - 25

STD: Standard

PIECE DE RECHANGE / SPARE PARTS / ERSATZTEILE

KIT DE REPARATION / REPAIR KIT / REPARATURSATZ		
	-	-

POS.	DESCRIPTION	DESCRIPTION	BESCHREIBUNG	MAT.	CLA-VAL Nr.
6	Chapeau	Cover	Deckel	BRZ	C-6034H
7	Ecrou d'axe	Stem nut	Stösselmutter	303	67802-06G
8	Rondelle de membrane	Diaphragm washer	Membranscheibe	LTO	C-0082C
9	Membrane	Diaphragm	Membrane	RBR	C-2105K
11	Axe	Disc guide	Gegensitz	LTO	C-2126F
12	Porte-joint & joint	Disc retainer assembly	Dichtungsträger	LTO/RBR	C-8939F
15	Siège	Seat	Sitz	303	62187A
16	Corps 1/2"	Body 1/2"	Gehäuse 1/2"	BRZ	57020
16.1	Corps 3/4"	Body 3/4"	Gehäuse 3/4"	BRZ	57282
17	Ressort	Spring	Feder	302	C-3396D
*17.1	Ressort renforcé	Spring (heavy)	Verstärkte Feder	302	31365A
23	Joint torique	O-ring	O-Ring	RBR	00718H
24	Vis (8x)	Screw (8x)	Schrauben (8x)	SST	67578-21B

* (31365A) Pour 100-KHR uniquement / For 100-KHR only / Nur für 100-KHR

TYPE 100-01/STD	CLA-VAL Nr.	
100-01 / 100-KR	VHG0032-011	1/2"
100-KHR	VHG0032-022	1/2"
100-01 / 100-KR	-	3/4"
100-KHR	-	3/4"

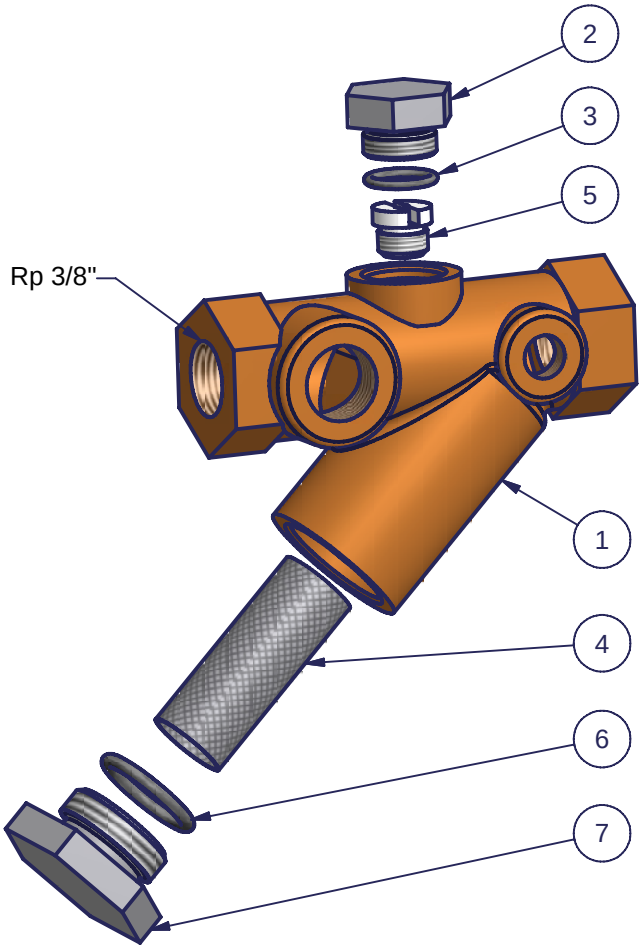
CLA-VAL **X44-A**

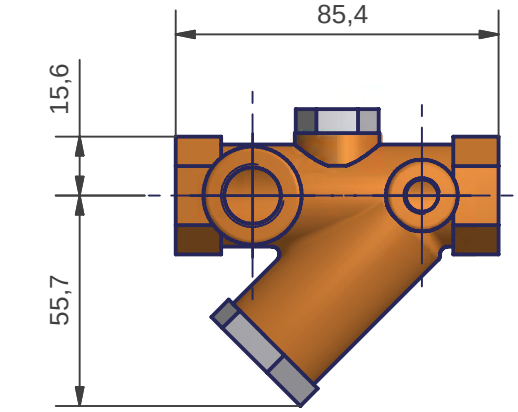
Filtre - Strainer - Filter X44-A1 & X44-A3
PN 10 - 16 - 25

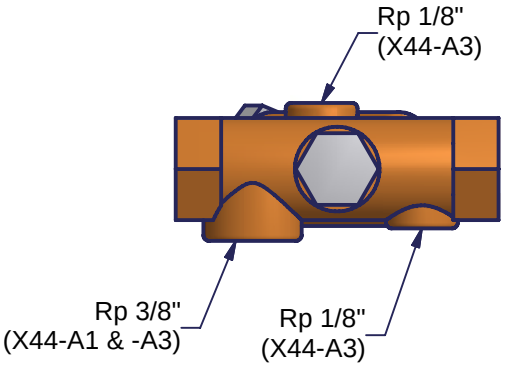
FILTRE A BUSE INCORPOREE
Ce filtre empêche tout corps étranger d'entrer dans le circuit d'asservissement. Il est recommandé de nettoyer périodiquement la cartouche du filtre. La vitesse de réaction de la vanne est liée au diamètre de la buse. Plus la diamètre est petit, plus la vanne réagit rapidement. Au contraire, pour un grand diamètre de buse la vanne va réagir lentement.

STRAINER AND ORIFICE ASSEMBLY
The strainer is installed in the pilot supply line to protect the pilot system from foreign particles. The strainer screen must be cleaned periodically. Speed reaction of the valve and orifice plug are directly connected. The valve will react quickly with a small orifice and on the contrary slowly with a big orifice.

FILTER MIT EINGEBAUTER DÜSE
Der Filter verhindert das Eindringen von Fremdkörpern ins Steuersystem. Das Sieb des Filters muss von Zeit zu Zeit gereinigt werden. Die Geschwindigkeitsreaktion des Ventils hängt mit der Düse zusammen. Je kleiner die Düse ist, je schneller wird das Ventil reagieren.







X44-A1 : 1 x Rp 3/8"

X44-A3 : 1 x Rp 3/8"
2 x Rp 1/8"

● Information

✔ X44A Standard	X44001LT
✔ X44A/SWS	X44002LT
✔ X44A/WWS	X44003LT
✔ X44A/IND	X44004LT
✔ X44A/OFS	X44005LT
✔ X44A/AF	X44801LT

CLA-VAL **X44-A**

Filtre - Strainer - Filter X44-A1 & X44-A3
PN 10 - 16 - 25

STD: Standard

PIECE DE RECHANGE / SPARE PARTS / ERSATZTEILE

KIT DE REPARATION / REPAIR KIT / REPARATURSATZ		
(a)	CLA-KIT X44A Standard (Cartouche, Screen, Sieb 0,2)	***CKX44-STD-01**
(b)	CLA-KIT X44A Standard (Cartouche, Screen, Sieb 1,6)	***CKX44-STD-02**

POS.	DESCRIPTION	DESCRIPTION	BESCHREIBUNG	MAT.	CLA-VAL Nr.
1	Corps X44A-1	Body X44A-1	Gehäuse X44A-1	BRZ	57094
1.1	Corps X44A-3	Body X44A-3	Gehäuse X44A-3	BRZ	57095
2	Bouchon supérieur	Plug	Zapfen	303	57333
3	Joint torique	O-ring	O-Ring	RBR	*00713J (a/b)*
4	Cartouche 0,2	Screen 0,2	Sieb 0,2	MO4	*68373A (a)*
4.1	Cartouche 1,6	Screen 1,6	Sieb 1,6	316	*57332 (b)*
5	Buse 0,8	Orifice plug 0,8	Düse 0,8	DEL	57227
5.1	Buse 1,0	Orifice plug 1,0	Düse 1,0	DEL	57227-01
5.2	Buse 1,2	Orifice plug 1,2	Düse 1,2	DEL	57227-02
5.3	Buse 1,6	Orifice plug 1,6	Düse 1,6	DEL	57227-03
5.4	Buse 2,0	Orifice plug 2,0	Düse 2,0	DEL	57227-04
5.5	Buse 2,4	Orifice plug 2,4	Düse 2,4	DEL	57227-05
5.6	Buse 2,8	Orifice plug 2,8	Düse 2,8	DEL	57227-06
5.7	Buse 3,2	Orifice plug 3,2	Düse 3,2	DEL	57227-07
5.8	Buse 3,6	Orifice plug 3,6	Düse 3,6	DEL	57227-08
5.9	Buse 4,0	Orifice plug 4,0	Düse 4,0	DEL	57227-09
5.10	Buse 4,8	Orifice plug 4,8	Düse 4,8	DEL	57227-10
6	Joint torique	O-ring	O-Ring	RBR	*00751J (a/b)*
7	Bouchon filtre	Strainer plug	Filter Zapfen	303	57334
-	Bouchon X44A-3	Plug X44A-3	Zapfen X44A-3	316	BGT0001

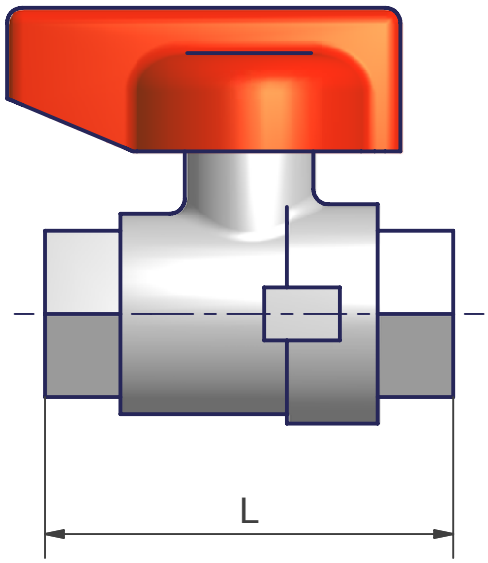
CLA-VAL **RB-117**

Accessoires - Accessories - Zubehör
PN 10 - 16 - 25 - 40

Robinet de barrage à bille
Corps laiton nickelé ou inox, mécanisme interne en inox

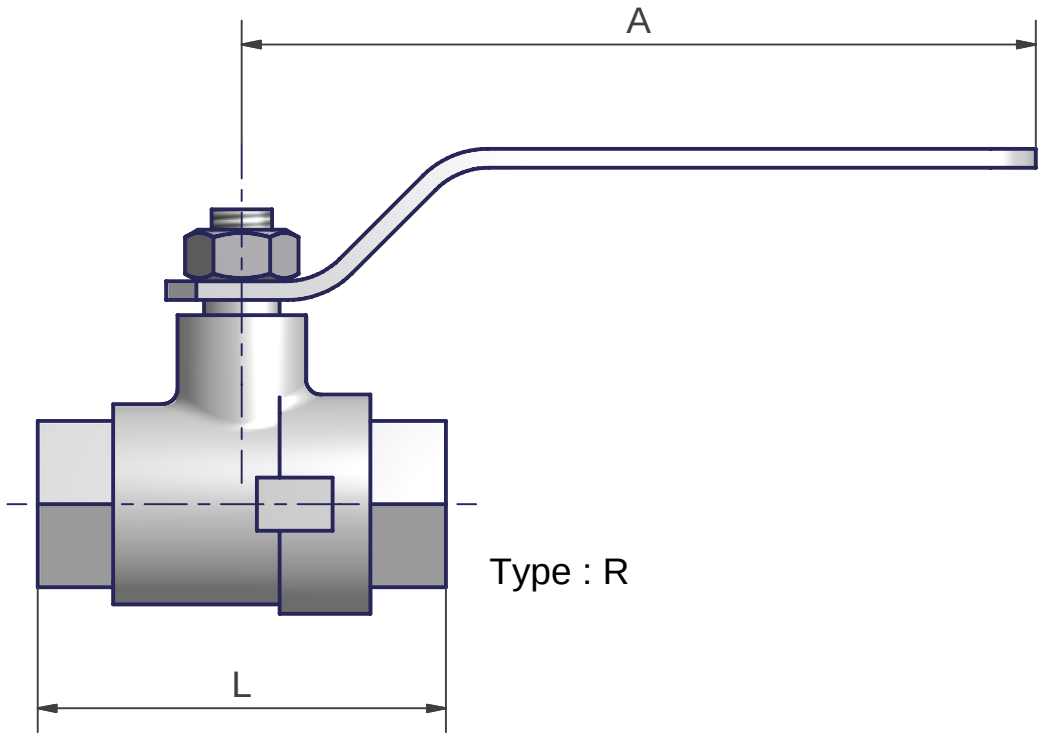
Isolation Ball Valve
Stainless steel or nickel plated body, stainless steel 303 trim

Kugelhahn
Gehäuse aus vernickeltem Messing oder Edelstahl, Innenteile aus Edelstahl



Rp	3/8"	1/2"	3/4"	1"
L	49	61	70	84
A	85	85	105	105

Type : M



Type : R

CLA-VAL **Form**

Valve Specification

Client / Contact:	
Ref.:	Date:

HYDRAULIC PARAMETERS			
A	Maximum flow rate (Q peak consumption)		l/s
	Upstream dynamic pressure (at Q peak)		bar
	Minimum flow rate (Q night)		l/s
	Upstream static pressure (at Q night)		bar
	Intermittent max. flow rate (Q fire)		l/s
B	Back-pressure (water level in reservoir)		m

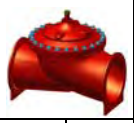
SETTING			
C	Flow rate		l/s
D	Surge flow rate (surge flow closing)		l/s
E	Downstream pressure		bar
F	Surge pressure rate (surge pressure closing)		bar
G	Upstream pressure or relief pressure		bar
I	ΔP > 20 bar ☐ Yes => ☐ No		bar

J	SCHEMATIC

CLA-VAL Form

Valve Specification

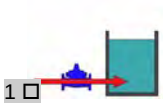
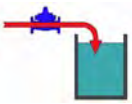
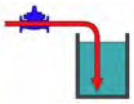
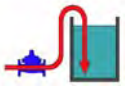
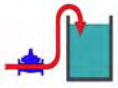
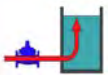
CLA-VAL MAIN VALVE

K	☐ NGE		☐ NGE-316		☐ GE		☐ AE		☐ TYTAN		☐ TDV			
														
DN	**Rp**	**DN**	**Rp**	**DN**	**Rp**	**DN**	**Rp**	**DN**	**Rp**	**DN**	**Rp**	**DN**	**Rp**	**DN**	**Rp**
32	1 ¼"					☐	☐	☐	☐						
40	1 ½"			☐		☐	☐	☐	☐						
50	2"	☐		☐		☐	☐	☐	☐						
65	2 ½"	☐		☐		☐	☐	☐	☐						
80	3"	☐		☐		☐	☐	☐	☐			☐			
100		☐		☐		☐		☐				☐			
125		☐		☐											
150		☐		☐		☐		☐				☐			
200		☐		☐		☐		☐				☐			
250		☐				☐		☐				☐			
300		☐				☐		☐							
350		☐				☐		☐							
400		☐				☐		☐							
450		☐													
500		☐													
600		☐													
S 600										☐					
S 700										☐					
S 800										☐					
M 900										☐					
M 1000										☐					
L 900										☐					
L 1000										☐					
L 1200										☐					

VALVE INSTALLATION

L	1 ☐	2 ☐	3 ☐	4 ☐	5 ☐

LEVEL CONTROL INSTALLATION

M	1 ☐ 	2 ☐ 	3 ☐ 	4 ☐ 	5 ☐ 	6 ☐ 

Reservoir ☐ Open	Reservoir ☐ Closed	☐	Constant level
		☐	2 levels (high and low)
		☐	1 high level
		☐	1 low level

ELECTRICAL SPECIFICATIONS

N	When switched off, the main valve is:	(Type D) ☐ Opened	(Type E) ☐ Closed	Notes:			
		Standard					
	Voltage	☐ **220 V**	☐ 110 V	☐ 48 V	☐ 36 V	☐ 24 V	☐ 24 V	☐ Other:
	Frequency	☐ **50 Hz**	☐ VDC	☐ Other:				
	Mode	☐ **Mono-stable**		☐ Bi-stable				

CLA-VAL Form

Valve Specification

O	STANDARD CLA-VAL VALVES: Catalog and Website											
Downstream Control			**Upstream Control**			**Flow Rate Control**			**Level Control**		
☐ 90-01	AEL	OIO	☐ 50-01	AGL	OI-	☐ 40-01	ACL	OI-	☐ 100-CF9	ABLM	OI-
☐ 90-CF9	ABELM	OIO	☐ 50-CF9	ABGLM	OI-	☐ 40-CF9	ABCLM	OI-	☐ 113-CF9	ABLM	OI-
☐ 91-01	AEL	OIO	☐ 51-01	AGL	OI-	☐ 41-01	ACL	OI-	☐ 427-01	ABLM	OI-
☐ 93E/D-01	AELN	OIO	☐ 58E/D-01	AGLN	OI-	☐ 43E/D-01	ACLN	OI-	☐ 429-01	ABLMN	OI-
☐ 92-01	AEGL	OIO	☐ 52-03	AEGL	OI-	☐ 45-01	ACGL	OI-	☐ 208-01	ABLM	OI-
☐ 92-02	AEGL	OIO	☐ 52-03R	AEGL	OI-	☐ 49-01	ACEL	OIO	☐ 210-01	ABLM	OI-
☐ 94-01	AEFL	OIO							☐ 210-16	ABLM	OI-
☐ 94-16	AEFGL	OIO							☐ 210-21	ABCLM	OI-
									☐ 210-31	ABLM	OI-
									☐ 210-66	ABGLM	OI-

Pump Control			**Network Protection**			**Electrical Control**		
☐ 60-31/02	AEGL	OI-	☐ 81-01	AL	OI-	☐136E/D-01	ALN	OI-
☐ 60-31/72	AEGL	OI-	☐ 81-02	AL	OI-	☐136E/D-03	ALN	OI-
☐ 60-81	AEGL	OI-	☐ 85-01	ADL	OI-	☐ 136-07	ALN	OI-
			☐ 85-03	ADL	OI-	☐ 136-38	ALN	OI-
			☐ 85-18	AFL	OI-			

↑
Hydraulic parameters
And required settings

Standard Equipment:

Upstream manometer ➔	O
Position indicator X101 ➔	I
Downstream manometer ➔	O

ECO			**PLC**			**PCM**			**MVE**		
☐ 32-07	ALN	OI-	☐ 137/38/39-001	AEGLN	OI-	☐ 100-01	ABLM	OI-	☐137/38/39-500	ACLN	OI-
☐ 100-31	ABLMN	OI-	☐ 137/38/39-400	ACLN	OI-	☐ 90-01	AEL	OIO			
☐ 136-01	ALN	OI-	☐ 137/38/39-402	ACLN	OI-	☐ 50-01	AGL	OI-			
☐ 417-07	ABLMN	OI-	☐ 137/38/39-201	ABLMN	OI-	☐ 40-01	ACL	OI-			
			☐ 137/38/39-100	ABLMN	OIO		OI-				

P	OPTIONAL FEATURES				
☐ A	Flow Clean Strainer (X46A)	☐ O	Nylon Pipe Dia. 6/3 mm (STD with SERIE 40)	☐ W2	Opening Limiter (Level Control)
☐ C	One-Way Flow Control (Closing Speed) (CV)	☐ P	2-Way Pressure Cock (STD with SERIE 40)	☐ Y	High Capacity Strainer (X43/80-EP)
☐ F	Remote Pressure Sensing	☐ P1	Isolation Ball Valve	☐ Y2	Double Strainer (2 x X43)
☐ H	Solenoid Drain to Atmosphere	☐ S	One-Way Flow Control (Opening Speed) (CV)	☐ Y3	Double Strainer (1 x X43/80-EP + 1 x X43)
☐ H1	Solenoid Drain to Main Valve Outlet	☐ T	Delayed Opening (Serie 210, 2 Levels)	☐ Y4	Double High Capacity Filter (2 x X43/80-EP)
☐ M	Manual Command (Drain to Main Valve Outlet)	☐ V	Independant Opening / Closing Speed Setting (VRE)		
☐ M1	Manual Command (Drain to Atmosphere)	☐ W1	Anti Freeze Feature (Level Control)		

Q	ACCESSORIES	Note, preset:			
Position Indicator X101		☐ No			
Mechanical Lift Limiter X102-A		☐ Yes			
Hydraulic Lift Limiter X102-F		☐ Yes			
Magnetic Switch Assembly X105-M (1 A max)		☐ Yes	☐ 1 contact (X105-MCW)	☐ 2 contacts (X105-M2W)	
Electronic Valve Position Indicator e-Lift		☐ Yes	☐ 2 alarms	☐ 4 alarms	
Upstream Manometer		☐ No	☐ 0-16 bar (STD)	☐ 0-10 bar	☐ Other:
Downstream Manometer		☐ No	☐ 0-16 bar (STD)	☐ 0-10 bar	☐ Other:
Upstream manometer connector		☐ No	☐ CSA-12 (STD)	☐ CSA-11	☐ Other:
Downstream manometer connector		☐ No	☐ CSA-12 (STD)	☐ CSA-11	☐ Other:
Other:		☐			

CLA-VAL Form

Valve Specification

FLANGES DN ≤ 600			Standard Test CLA-VAL IT123	
	Flange drilling (CLASS)	Pressure (bar)	Test pressure (bar)	
		PFA	PT1	PT2
R	☐ ISO PN 10	10 bar	15 bar	11 bar
	☐ ISO PN 16	16 bar	25 bar	18 bar
	☐ ISO PN 25	25 bar	38 bar	28 bar
	☐ ISO PN 40	40 bar	44 bar	44 bar
	☐ ANSI 125	175 psi (12 bar)	18 bar	14 bar
	☐ ANSI 150	250 psi (17 bar)	26 bar	19 bar
	☐ ANSI 250	400 psi (28 bar)	42 bar	31 bar
	☐ ANSI 300	400 psi (28 bar)	42 bar	31 bar
	On request:	☐ **CE Test IT122**	☐ **Air Test IT125**	☐ **TYTAN Test IT126**

Definitions:
PFA: Allowable operating pressure: Maximum hydrostatic pressure that a component is capable of withstanding continuously in service.
PT1: Test Pressure 1: Pressure test used for: ← Shell pressure test.
PT2: Test Pressure 2: Pressure test used for: ↑ Pilot system pressure test.
→ Seat tightness test.
↓ Diaphragm tightness test.

TYPE OF FLUID AND CLA-VAL STANDARDS				
S	☐ Drinking water	☐ Industrial water	☐ Brackish water	Temperature:
	☐ Irrigation water	☐ Demineralised water	☐ Sea water	☐ Material in suspension

CLA-VAL STANDARDS FOR MATERIAL			Main valve	Pilot circuit
T	• Drinking water (PN 10-25) • Irrigation water • Active Cl < 0,30 mg/l • Total salts < 1,0 g/l	☐ STD (Standard)	**NGE / GE / AE / EAE / TDV** • Body: ductile iron* • Mechanism**: SS 303 • Bolting: SS 303	• Body: bronze • Mechanism: SS 303
	• Drinking water (PN 40+) • Industrial water • Active Cl < 0,50 mg/l • Total salts. < 5,0 g/l	☐ WWS (Waterworks)	**NGE-316 / Roll Seal** • Body: SS 316 • Mechanism**: SS 303 • Bolting: SS 303	• Body: SS 316L • Mechanism: SS 303 minimum
	• Industrial water • Brackish water • Active Cl < 1,00 mg/l • Total salts < 10,0 g/l	☐ IND (Industry)	**NGE-316 / Roll Seal** • Body: SS 316 • Mechanism**: SS 316 • Bolting: SS 316	• Body: SS 316L • Mechanism: SS 316 minimum
	• Brackish water • Sea water • Active Cl < 1,00 mg/l • Total salts < 40,0 g/l	☐ OFS (Offshore, Marine)	**NGE-316 / Roll Seal** • Body: SS 316 • Mechanism**: Monel • Bolting: SS 316	• Body: SS 316L • Mechanism: Monel minimum
	• Brackish water • Sea water • Active Cl < 0,30 mg/l • Total salts < 40,0 g/l	☐ SWS (Sea Water Service)	**NGE / GE / AE / EAE / TDV** • Body: ductile iron* • Mechanism**: Monel • Bolting: SS 316	• Body: marine grade bronze • Mechanism: Monel minimum
	* Ductile iron: GGG 40 epoxy coated 250 µm min		** Mechanism: stem, stem nut and cover bearing. Standard seat and disc guide: SS 316	

CLA-VAL STANDARDS FOR ELASTOMERS			Active Cl	Total salts	Note
U	☐	EPDM	< 0,3 mg/l	< 10g/l	Standard CLA-VAL
	☐	NBR	< 0,3 mg/l	< 40g/l	
	☐	Viton or Teflon protection	> 0,3 mg/l	< 40g/l	
	☐	EPDM, Viton or Teflon protection	Ozone (O_3)		

CLA-VAL STANDARDS FOR CALCAREOUS PROTECTION				
V	☐	Neutral water	(pH 7 - 9 / hardness: 15°F / active Cl < 0,1 mg/l)	STANDARD
	☐	Aggressive water	(CO_2 attack, pH 6 - 7)	WWS minimum recommended
	☐	Incrusting water	(calcareous precipitation, hardness > 20°F)	Delrin (ΔP < 5 bar) or Teflon protection